

Metal-detecting molecules may find use for groundwater cleanup, process water recycling, virus detection, more

Entrapping fragile molecular bundles in sol-gels enables practical sensors

By John German

Lab News staff

A new biochemical technique being refined at Sandia may soon enable sensors that can rapidly detect the equivalent of one contaminant particle among a billion other molecules in waste streams.

The technique makes use of large, molecular aggregates called "liposomes" that are tailored to react with particular metal ions in solution. A Sandia team is studying ways to entrap these spherical liposomes in porous silica materials called sol-gels — essentially whipped glasses — which may open doors to a variety of practical inventions, from water purity sensors in microchip factories to molecule-sized metal detectors for environmental cleanup operations.

Eventually the technique might enable a family of biosensors that could rapidly and from the convenience of home indicate whether a person has a particular virus.

An unexpected discovery

The technique relies on a biochemical process discovered a few years ago at Caltech, where Darryl Sasaki, now of Materials Aging & Reliability: Bulk Properties Dept. 1811, was a postdoc studying ways to purify protein samples by patterning thin-film materials with liposomes. Depending on the "functionalities," or chemical roles, assigned to reactive molecular groups on the liposomes' surfaces, areas on the film could selectively bond with certain proteins and reject others.

In a serendipitous discovery, Darryl found that when he added copper ions to a liquid solution containing a liposome he had created, the sample's color emission under a fluorescence spectrophotometer changed from green to blue very rapidly. The researchers surmised that the introduction of the charged metal ions prompted

(Continued on page 4)

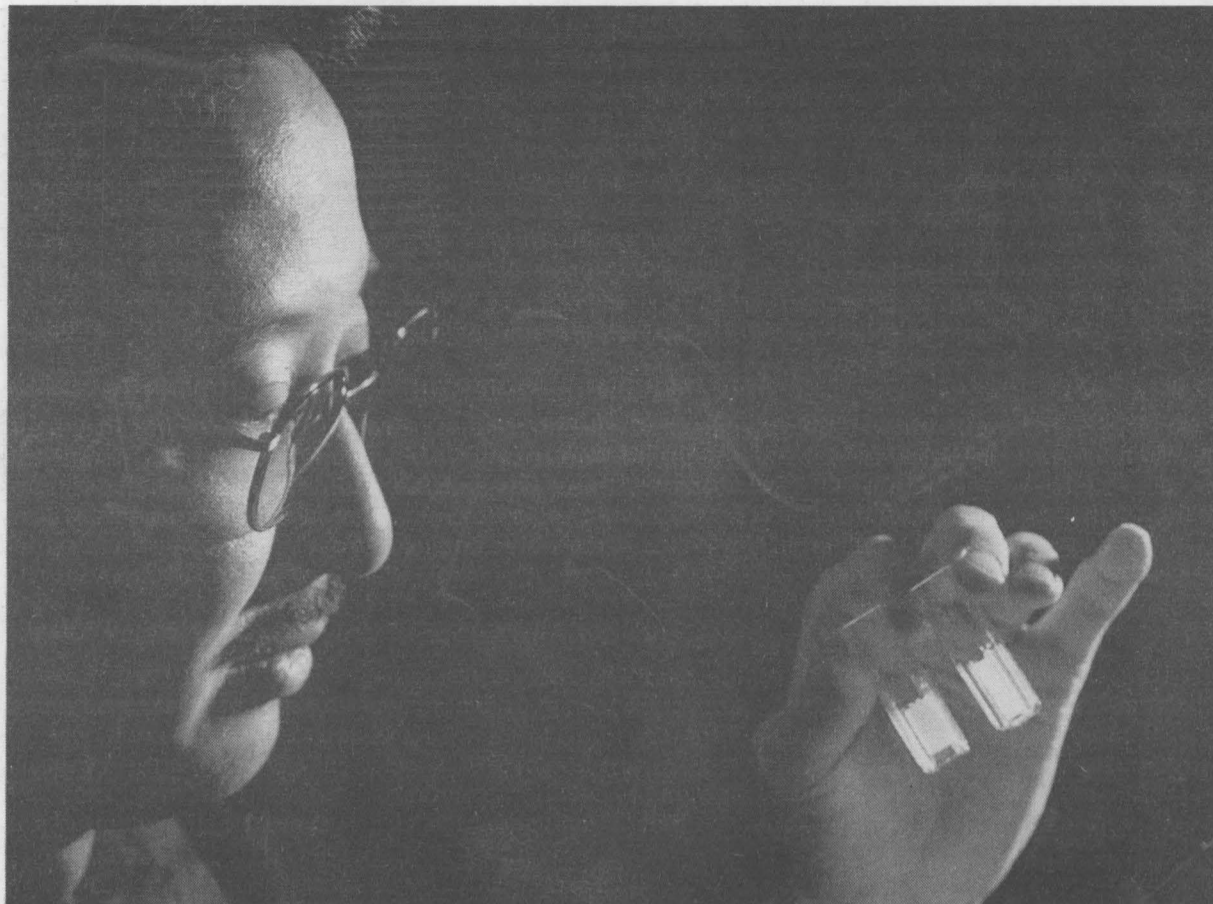
Quotas, Labs-wide equity emerge as employees' top IJS concerns

Last issue we asked readers to submit to us their burning questions about the new Integrated Job Structure (IJS). We promised we'd get answers, and we did — from Human Resources Director Don Blanton (3500), Compensation and Job Evaluation Manager Ed Cassidy (3545), and IJS project leader Kirsten Randolph (3545) during interviews by *Lab News* senior editor John German May 15 and 16. Most of your questions and their answers are published beginning on page 8 (see below).

By the submission deadline (May 14), we received some 45 responses. Many of the submissions echoed what appear to be employees' two primary concerns: 1) "Stealth quotas," or unstated limits on the number of employees placed in the higher, or "principal," job levels, and 2) job-level consistency across organizational lines.

We consolidated questions that dealt exclusively with those issues. A few of the submissions were complex, however, and contained these concerns plus others; we tried to extract these additional concerns and ask them as separate questions. In all cases, we have preserved questioners' anonymity.

Because of the number of questions, we aren't able to publish all the questions and answers in this issue and still provide other news. On pages 8, 9, and 10 are the questions and answers addressing the IJS in general, quotas, cross-organizational consistency, interpretation of the placement criteria, and managers' freedoms in placing employees. Look for the second installment in two weeks — in our June 6 issue — to include questions and answers about promotion, salary, and the job ladders and categories themselves.

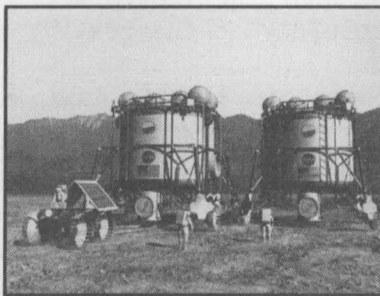


METAL-DETECTING MOLECULES — Darryl Sasaki holds vials of a solution containing liposomes targeted for copper. Copper ions have been added to the solution on the left; no copper has been added to the solution in the right vial. (Photo by Randy Montoya)

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New vacation policy allows greater latitude, more individual control

Policy setting maximum accrual of 240 hours takes effect Oct. 1

By Bill Murphy

Lab News staff

Beginning Oct. 1, Sandia nonrepresented employees will be functioning under a new vacation carryover policy designed to simplify and standardize the leave carryover process and give employees more responsibility for managing their own vacation time.

The change, which will coincide with implementation of the Labs' new PeopleSoft personnel management software system next October, is just one of some two dozen significant changes in business practices, policies, and procedures that will be rolled out between now and the beginning of the next fiscal year (*Lab News*, April 11).

The widespread changes, including implementation of widely used commercial software products to facilitate electronic commerce, are intended to streamline Labs processes, make them more efficient and effective, and bring

them into line with widely recognized common commercial practices.

Under the new vacation policy, a maximum vacation balance of 240 hours will be allowed. Employees will be allowed to carry over as much of that 240 hours as they like from one month to the next, without any special approval from their manager or director. Convertible vacation — leave accumulated prior to 1970 (so-called "golden years" leave) or resulting from reclassification from a represented to a nonrepresented position if the employee had vacation accruals that could be carried over due to a union agreement — is not affected by the policy change.

According to Jann Levin, Manager of Health and Work/Family Benefits Dept. 3343, several factors led to the decision to change the vacation accrual and carryover policy.

First, she notes, the change brings the Labs into line with commercial practices, which have

(Continued on page 5)

This & That

First-time pops proliferate in 2643 - If you see more weary-looking people than usual in Electromechanical Engineering Dept. 2643, it's for good reason. The wives of three department members (total of 17 staff) had their first children within five days in late April and early May. Congrats to all three families. Here are the Sandians' names, wives' first names, children's first names, and birth dates:

- David Plummer, wife MaryBeth, daughter Allison, April 30
 - Fernando Bitsie, wife Terri Ann, son Bryce, May 2
 - Todd Christenson, wife Holly, daughter Lauren, May 4
- (Thanks to 2643's Thisbe Jerome for the heads-up on this.)

* * *

Baffled by cyberbabble? - If you don't know the difference between an applet and an orangelet, or an FTP and an RFC, then I've got some help for you. Check out this Web site: "Steve's Cyberspace Dictionary" at <http://www.edmweb.com/steve/cyberdict.html>. I have no idea who Steve is, but his site has some short, useful definitions and links to many other helpful sites. IMNSHO, we have way too much jargon today, but some people spout so much of it that it's becoming necessary to know some basic terms just to interpret all the cyberbabble in our messages. BTW (By the way), IMNSHO translates to "In my not-so-humble opinion."

* * *

Help stamp out "colorized" e-mail messages - Those of us who get dozens of e-mail messages daily will appreciate it if you folks who send them in bright colors will reconsider that. Many colored messages are very hard to read on a computer screen, particularly long messages with colored type and a colored background. And when printed on a black-and-white printer, some such messages are nearly impossible to read. The most annoying ones are those gaudy yellow-type-on-a-blue-background messages, apparently the built-in default for cc:Mail.

Here's how to change your default settings. (Note: Precise methods may vary slightly for different software versions and machines, but I'll bet you can figure it out if a writer can.) **IBM system:** While in your cc:Mail system, start a new message or start replying to an old one, select the text menu and then the colors option, select the text and background color (black type on a neutral background was preferred by nearly everyone I asked), and then check the "save as default pen" box. **Macintosh system:** While in your cc:Mail system, go to file menu at top of screen, open preferences, and click on text editor, which allows you to set your preferred text/background colors plus type size and face.

* * *

Make this tape and make my day! - The *Sandia Daily News* announced last week that all Sandia VP administrative assistants have copies of a videotape for loan that covers coming changes in Sandia's business practices. You know what I'd really like to see? A long videotape titled "Stability at Sandia," covering hundreds of processes and practices that are going to stay the same in coming years, with absolutely no changes. Now wouldn't that be nice?

- Larry Perrine (845-8511, MS 0167, lgperri@sandia.gov)

1,500 participate in Digit Pace response exercise

About 50 Sandians have joined more than 1,500 representatives of federal, state, and local governments during this week's "Digit Pace" accident response exercise on Kirtland Air Force Base, May 19-23.

DOE, the Department of Defense, and other federal agencies and select state, county, and local

government offices team up annually for a week-long, full-field, multiagency exercise during which agency "players" respond to a simulated accident involving nuclear weapons. The purpose is to allow those who would respond to such an accident an opportunity to interact in a life-like situation and to train in accident response methods.

This was the first time DOE has participated as the lead federal agency.

Stan Spray (12331), Sandia Accident Response Group program manager, says the Sandians involved in this year's exercise participated as players, controllers, and support people. John Hoffman and other members of System Studies Dept. 12331 developed the Digit Pace accident scenario with input from the agencies involved.

In the scenario, a tanker truck swerves across I-40 and collides with a DOE Safe Secure Transport (SST) convoy carrying nuclear warheads, causing an explosion, fire, and scattering of plutonium. The fictional accident takes place near a "notional city" somewhere in New Mexico. The exercise was actually conducted on KAFB.

Bill Nickell, Director of Surety Assessment Center 12300, is the lead Sandia representative.

Other participating organizations include the Federal Emergency Management Agency, Environmental Protection Agency, National Transportation Safety Board, Departments of Health and Human Services and Agriculture, various State of New Mexico offices, Bernalillo County, and the Albuquerque Emergency Management Department.

-John German

Operations resume at Labs' Annular Core Research Reactor

Operations at the Annular Core Research Reactor (ACRR) in Area 5 resumed early last week following a review of operational and safety procedures at the reactor.

After a set of routine, low-power operations are completed at the ACRR this month, Sandia will begin modifying the research reactor for production of molybdenum-99, the primary medical isotope used in the nation's health care system.

Sandia suspended ACRR operations on Dec. 18, 1996, following a Dec. 7 event in which automatic safety systems shut down the reactor. Operations at other Area 5 nuclear facilities were suspended on Feb. 3 while a detailed examination of operations and safety policies and procedures was conducted (*Lab News*, Feb. 14).

Detailed review

The review was conducted during February and March by an eleven-member panel chaired by nuclear safety consultant Robert Seale of the University of Arizona, who is also chairman of the Nuclear Regulatory Commission Advisory Committee on Reactor Safeguards. The panel included outside consultants and Sandia staff and managers.

In an interim report issued Feb. 28, the panel recommended a set of short-term changes that include a renewed focus on safety, management requirements, procedural improvements, training for operators and managers, improvements in communications between staff and managers, and improvements in occurrence reporting. These short-term recommendations were reviewed by senior management and accepted as a sound basis for resuming operations, says Paul Pickard (9360).

Work at the other nuclear facilities in Area 5 - the Sandia Pulse Reactor, the Hot Cell Facility, and the Gamma Irradiation Facility - resumed in March after completion of the review for those facilities.

The panel also identified longer-term issues, including recommendations relating to Laboratory support policies for nuclear facilities, changes to management structure for nuclear facilities, and simplification of the Labs' event reporting system.

"These are infrastructure issues that are going to require upper management involvement and long-range planning, particularly as we move from R&D activities to a medical isotope production mission in the ACRR," Paul says.

Executive VP John Crawford says, "I have reviewed the report of the panel and support both the short-term recommendations necessary for resumption of operations of the facilities and the longer-term recommendations that will significantly improve how we manage and operate our facilities."

Moly-99 modifications

A DOE assist team, comprising DOE staff and contractor staff from other nuclear facilities, has reviewed corrective actions and concluded that: "The implemented short-term corrective actions represent a good start in Sandia's road to sound facility operations. The implementation of all the corrective actions and the planned modifications of the facilities should enable Sandia to produce moly-99 in a safe and cost effective manner."

Dick Coats (9360), Medical Isotope Program Manager, says the temporary shutdown will delay production of moly-99 at the Labs. Although many aspects of the Medical Isotope Program have gone forward as planned, he says, the delayed modifications to the ACRR and Hot Cell Facility must be completed before actual production can begin.

"The panel's review and recommendations encompassed many of the issues that we were going to have to address before the start of isotope production in any event," he says. "As a result, we now have a head start on the operational changes that are necessary to meet FDA [Food and Drug Administration] quality requirements and establish a reliable production operation."

-John German

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LOCKHEED MARTIN

Plutonium's discovery recounted by Glenn Seaborg

Seaborg shared 1951 Nobel Prize in Chemistry for transuranic research and directed AEC

By Nancy Garcia

California reporter

Glenn Seaborg, the only living person to have an element named after him, opened a talk the other night in Livermore by saying "the International Commission on Nomenclature decided being alive is all right after all."

Element 106, a short-lived creation of a particle accelerator, is now destined to be named "seaborgium" after this codiscoverer, who has already been honored with the 1951 Nobel Prize in Chemistry with his colleague Edwin McMillan for research into transuranic elements. As part of that work, Seaborg, an 85-year-old Bay Area resident, discovered plutonium in 1941 with McMillan and colleagues at UC/Berkeley.

Seaborg spoke to members of the community in Livermore about the events that preceded and followed that discovery.

He flashed a slide on a screen showing the Periodic Table in 1941, which ended with number 92, the heaviest naturally occurring element, uranium. Plutonium, element 94, was created by bombarding uranium with deuterium (a heavy form of hydrogen bearing a neutron as well as a proton) in UC Berkeley's cyclotron particle accelerator.

Earlier attempts to create new, heavier elements by bombarding uranium with neutrons led in 1938 to the discovery of fission by Hahn and Strassmann in Germany. Successive splitting of atoms in a chain reaction "made possible the concept of the atom bomb," Seaborg said.

Stored first sample in a cigar box

Seaborg had joined UC Berkeley as a graduate student in 1934, working with Ernest O. Lawrence, and was an instructor at the campus in 1941 when his team created plutonium. He stored the small sample, a fraction of a microgram, on a platinum plate in one of his boss's empty cigar boxes tucked into a laboratory cubbyhole. The box was located 25 years later for a Smithsonian exhibit.

During the war, the Berkeley researchers voluntarily kept their work secret. They finally published their discovery in 1948 in the *Journal of the American Chemical Society*. The group had settled on the name plutonium (after the farthest planet Pluto) because the two preceding elements on the Periodic Table, uranium and neptunium, were named after the planets Uranus and Neptune. Rather than use the more logical symbol "Pl" for the new element, they selected the letters "Pu" as a small joke, and were surprised to not receive any objections upon publication.

(In 1991, when Seaborg gave a colloquium at Sandia/New Mexico, he invited the discoverer of Pluto, Clyde Tombaugh, a New Mexico resident whom he had never met, to attend and join him afterward for a historic media availability. See *Lab News*, June 14, 1991. Tombaugh died earlier this year.)

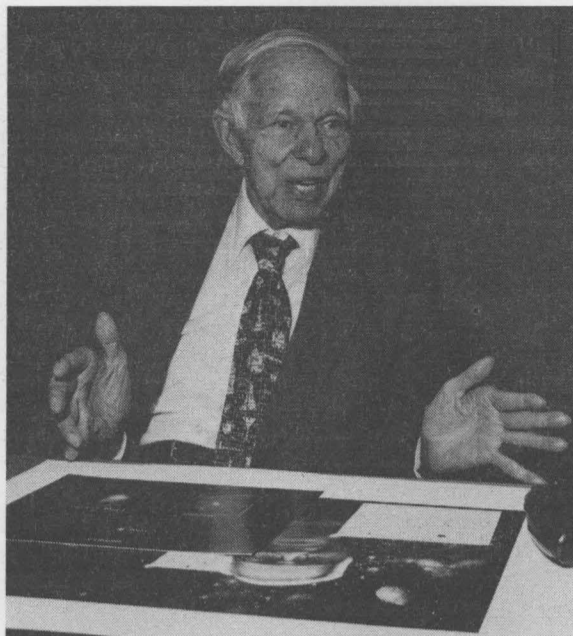
Because fission had been discovered in Germany, Seaborg said, "we were convinced they were ahead of us. We worked six days a week and five evenings a week." About a month after confirming they had created plutonium, the team bombarded three pounds of it for several days to show it was fissionable with slow neutrons, and thus could provide atomic energy.

'Everything depended on this'

In 1942, Seaborg went to Chicago to lead up to 100 scientists who were trying to separate plutonium to be produced in a chain reactor. Small amounts of the scarce material were studied in solution in microcapillary tubes that were manipulated under a microscope.

To purify the metal, his group precipitated Pu(IV) — its fourth oxidation state — with bismuth phosphate. Because bismuth carries three charges, it shouldn't have pulled this form of plutonium out of solution, but it did.

"You can imagine the pressure I was under," Seaborg said. "Everything depended on this. There were a lot of people who said it was the biggest



NOBEL LAUREATE Glenn Seaborg after his 1991 colloquium at Sandia/New Mexico.

Sandia California News

boondoggle. Our microchemists tested over and over. It took a lot of self-confidence to go ahead."

Dupont Chemical Co. needed to build a separation plant. Seaborg said that he didn't have an isolation process yet and was told to use his best bet, which was to precipitate plutonium peroxide from acid solution. "They built the plant and we had to make it work, and it worked," Seaborg said. "The plant operated beautifully right from the beginning."

Likewise, he said the Manhattan Project succeeded in an equally practical way. "We exchanged information as needed. There was never a leak. Security was complete. . . . Today we couldn't do it; you just can't pull together anymore and collaborate and cooperate to this extent."

Sandia/Lockheed Martin gives \$10,000 to help upgrade computers for schools' use

Sandia/California, with funding from the Lockheed Martin Foundation, has donated \$10,000 to Crayons to Computers to help kick off a new program of refurbishing used computers for area schools in the East Bay.

The grant will be used to match state funds that can be used to purchase parts needed to upgrade older computers to Pentium level. The goal is to supply 1,500 reconditioned computers free to area schools over the next year.

The grant is the single largest amount ever awarded by Sandia/California, which distributes up to \$40,000 each year to educational and nonprofit groups.

"We are pleased to make a donation to this very worthwhile program initiated by the Tri-Valley Business Council and hope our contribution will spark the interest of other firms to participate in some way as well," says 8000 VP Tom Hunter. "Sandia is committed to being a good neighbor and is pleased to provide grants for projects that can positively impact the quality of life in our local communities."

"This is the first step in a multiphase program where our employees will be able to volunteer to help rebuild the PCs at Crayons to Computers over the coming year," says Karen Scott, Manager of Science & Technology Outreach Dept. 8818. "This is one of Sandia's several education programs in support of the President's Call to Action for American Education, which is aimed at bringing the power of the Information Age into all of our schools." She presented the check on behalf of Sandia at Crayons to Computers during a reception recognizing major contributors to their program over the past year.

"I can't express how important this grant is to our program and to local schools," says Mike

Seaborg served on a seven-member committee that prepared the so-called Franck Report issued June 11, 1945, to advise whether there was a compelling reason to use an atomic bomb. Germany, it turned out, had not pursued development of the bomb and had surrendered the month before. Although the committee recommended demonstrating an explosion on a barren island or in the desert, the US bombed Japan, bringing the Pacific war to an end.

"That may have been the right decision," Seaborg said in hindsight. "It saved hundreds of thousands of lives — on both sides."

Now there are up to 200 tons of weapons-grade material in the US and Russia, and the nearly 1,000 tons in civilian reactors. He believes the material would best be disposed of through the US policy of burning metal oxides (MOX) in reactors for energy and burying (with fission products) whatever is unsuitable for burning. This approach would render the material "pretty much unsuitable for weapons," he said. He believes well-contained nuclear reactors pose a better environmental tradeoff than burning fossil fuels, saying, "I think I'm an environmentalist. Even when we had a meltdown, no one was hurt. We had containment. Nothing could go worse than Three Mile Island," the US nuclear reactor that lost coolant water and partially melted down in 1979.

Seaborg added that the 1986 Chernobyl accident, on the other hand, had no containment.

In all, Seaborg has helped discover 10 elements (up to element 112), more than anyone in the world, and many isotopes, pointed out Dan Lee, chairman of the Valley Study Group where Seaborg gave one of the group's monthly educational lectures.

Chairman of the Atomic Energy Commission (a predecessor of the Department of Energy) from 1961-1971, Seaborg is currently University Professor of Chemistry for the University of California, Associate Director-at-Large of Lawrence Berkeley National Laboratory, and Chairman of the Lawrence Hall of Science.

LaLumiere, director of the nonprofit. "This allows us to start refurbishing computers at a rapid rate. The Sandia grant will put 100 Pentiums into local schools in about a month. That's a big return for Sandia and for the local schools."

Sandia/California has given out nearly \$30,000 through the foundation already this year. Other sizable gifts include \$8,000 (Thunderbird Awards) to eight high school seniors for overcoming adversity in their school years, \$1,500 to the Livermore Youth Advisory Commission for the Multi-Cultural Festival in which Sandia Diversity Outreach Groups participated, \$5,000 to Expanding Your Horizons in Math and Science for young women, and \$1,500 to the Volunteer Center of Alameda County.



HANDING OVER a giant replica of the \$10,000 check are, from right to left, Paul Brewer (8900) and Karen Scott (8818) to Crayons to Computers director Michael LaLumiere and Tri-Valley Business Council president Steve Tanner.

Metal sensors

(Continued from page 1)

the liposomes to scramble their molecular arrangements to incorporate the new ions, thereby altering their fluorescence signal.

"When the reactive head [surface] groups accept the metal ions, they develop equally strong ionic repulsive forces among them, causing them to disperse across the surface of the liposome," says Darryl. "We think the color change results from this dispersion."

The liposomes reacted to other metals as well — manganese, cobalt, calcium, and nickel. Their high sensitivities to a variety of metal ions suggested uses outside the protein-separation arena.

"We began to see this as a candidate technology for practical sensors that could rapidly detect heavy metals in nanomolar concentrations," he says.

Finding the right medium

Darryl joined Sandia in 1994. With funding from the Labs' Research Foundations program, he began trying to forge the raw biochemistry into something practical.

Because the liposomes are chemically fragile, the liposome-bearing solutions had a brief shelf life; after a few days, the molecules tended to cling to the sides of containers or were eaten by molds or bacteria in the solution. Also, the liposomes, when free-floating in a liquid, weren't very practical for sensor applications. A solid, dry medium was needed, one that could physically immobilize the liposomes while stabilizing them chemically.

To solve these problems, Darryl and team members Doug Loy (1815) and former Sandia postdoc Stacey Yamanaka (now at Texas Instruments) developed a procedure to entrap the liposomes in sol-gels, a class of solid, lightweight, silica-based materials Sandia has studied for decades as part of its materials science program. The entrapped liposomes reside within cavities in the porous sol-gel matrix but are not chemically attached to the matrix.

The kicker: Not only did the sol-gel-entrapped liposomes react instantaneously to metal ions, their sensitivities were 4 to 50 times greater than those observed for the liposomes in solution — in the parts-per-billion range. Although it's scientifically unconfirmed, Darryl thinks the

Virus detectors among other liposome uses

Far-out uses for sol-gel entrapped liposomes could include rapid laboratory or in-home virus detectors, suggests Darryl Sasaki.

"You might put saliva or a blood sample on a strip of this sol-gel material," he says, "and the sensor's color would change depending on whether it detected the virus the liposomes were looking for."

Such a sensor is a long way off, he cautions. Liposomes would have to be developed with biochemical receptors that upset the liposomes' molecular arrangements in the presence of targeted viral particles. Other refinements would have to be made to cause a color change.

Sandia is working with Lawrence Berkeley

National Laboratory researcher Deborah Charych on recognition groups for viral particles, and the team has created a sol-gel entrapped liposome that shows high sensitivity to a common influenza (flu) virus. Darryl and Joseph Schoeniger (8120) are investigating a similar biochemical sensor technique for detecting trace concentrations of bacteria such as *E. coli* on raw meat for use in meat packing plants (*Lab News*, Feb. 28).

Sensors for visually identifying very low-level concentrations of airborne biological weapons agents, which might be useful for treaty verification work, also are among a list of intriguing defense uses for this type of sensor.

negatively charged silica surface (a product of sol-gel formation) acts like an ionic sponge, increasing concentrations of positively charged metal ions near the sol-gel material's surface and the odds that a metal ion will encounter and react with a liposome within.

And because researchers may now be able to adjust the cage-like silica microstructures to within nanometers (billionths of a meter), liposome-bearing sol-gels might one day be tuned to keep large molecules or particles out and let smaller ones into the molecular mesh to react with the liposomes, thereby increasing their molecular selectivity, he says.

Parts-per-billion sensitivities

Theoretically, says Darryl, liposomal molecules can be created with parts-per-billion sensitivities to a variety of contaminants commonly found at environmental remediation sites. Such liposomes entrapped in sol-gels could lead to practical sensors for rapidly detecting very low levels of heavy metal or radionuclide contamination in groundwater for site characterization applications. The Sandia team now is working to create liposomal sensors targeted for lead, mercury, and chromium.

Similar in-situ sensors might detect parts-per-billion concentrations of iron, copper, zinc, nickel, lead, or other contaminants common to process streams at microchip fabrication facilities, a capability that might help chip manufacturers ensure that recycled process water is as contaminant-free as possible. (Ultraclean

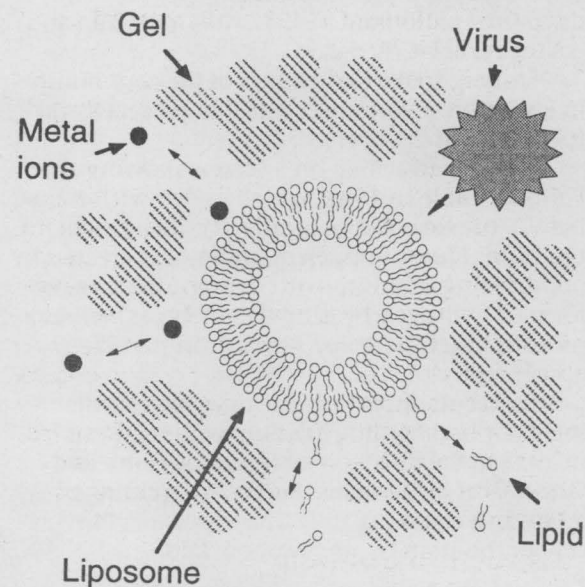


ILLUSTRATION showing liposomal molecular aggregate (center) entrapped in a sol-gel matrix (surrounding liposome). The sol-gel's porous microstructure allows small solutes, including viral particles and metal ions, into the structure to react with the liposome.

process water recycling is a major concern in the microelectronics industry these days as manufacturers strive to reduce water use). One sensor company already has expressed an interest in such a technology.

And, Darryl says, a variety of other, more far-out uses are being considered for sol-gel entrapped liposomes, he adds. (See "Virus detectors among other liposome uses" above.)

Rapid-response in-situ sensors

For sensor applications, sol-gels have a number of advantages over other materials. They can be applied as a thin film to a variety of surfaces or cast in bulk form into nearly any shape. They are optically clear, so liposomal color changes would be easy to read. The entrapped liposomes seem impervious to fungal or bacterial attack even after months on a laboratory shelf (probably due to the sol-gels' small pore sizes, which don't allow fungal or bacterial particles into the matrix, Darryl says). And they're durable — the liposomes remain intact even when the sol-gel structure is damaged.

The liposomal sensors also are blind or weak in reacting with some ions, such as sodium, "so they may be good for detecting contamination in seawater," he says.

In addition, says Darryl, the very few in-situ heavy metal sensors available today typically require minutes to hours to respond definitively in the parts-per-billion range. The liposomes themselves respond in less than a second. The team is experimenting with sol-gel film thicknesses to get response times down when they are entrapped in sol-gels, he says.

Darryl presented a paper describing the technique during the 213th National Meeting of the American Chemical Society in April in San Francisco.

"These materials exhibit remarkable response times, selectivity, and easily monitored optical signals," Darryl says. "This would be an inexpensive, rapid, highly sensitive detection capability that we hope will soon find use in a variety of sensor applications."



EMPLOYEE RECOGNITION NIGHT — Executive VP John Crawford (center foreground); Weapon Systems Div. 2000 VP Heinz Schmitt (center background); and Labs President Paul Robinson (right background) dance to a medley of '50s and '60s rock 'n' roll songs performed by members of the Pink Flamingos band during Sandia's Employee Recognition Awards night. More than 100 award winners and representatives of 19 award-winning teams were honored at the event, held at the Albuquerque Marriott Saturday evening, May 10. (See the May 9 *Lab News* for details about the award winners.)

Vacation policy

(Continued from page 1)

proven their practicality in the marketplace. In addition, Jann says, the pending transition to PeopleSoft software provides an ideal opportunity to do a make-over of cumbersome and inefficient processes.

Under current policy, carryover of 17 to 40 hours requires manager approval, while carryover of 41 to 120 hours requires director approval. Carrying over more than 120 hours from one year to the next is intended to accommodate what current policy guidelines call unusual circumstances. In these unusual cases, the employee must secure the written approval of his or her director and the VP of Human Resources Div. 3000.

The 240-hour maximum balance is more hands-off administratively than current policy, but there is a caveat: No additional vacation will be accrued once the 240-hour cap is reached. Think of it this way: Under the new policy, your maximum vacation leave benefit as a Sandia employee is 240 hours; you don't earn and cannot accumulate any more than that until you reduce the balance by using some vacation time.

And here's a change: Sandians with more than 10 years on the job currently accrue all their annual vacation hours at the beginning of the fiscal year — it's added as a lump sum all at one time, to be drawn on during the year. Under the new process, all nonrepresented Sandians will accrue leave on a monthly basis so they don't reach the 240-hour maximum so quickly.

A practical example

There's a good reason for the change to a monthly system. Consider a practical example: You have worked at Sandia for 12 years. Under the new policy, you want to carry over 150 hours of leave. That in itself is no problem. You don't need anyone's permission. You just do it. But come Oct. 1, your lump-sum accrual of 192 hours of leave plus your 150 hours of carryover would put you at 342 hours of leave, well over the 240-hour cap. Since you can't accrue more than 240 hours, you would in effect not earn 98 hours of potential vacation time as a result of the lump-sum, beginning-of-the-year accrual method.

By accruing leave on a monthly basis, you don't get into this problem. It's like this: You carry over 150 hours. In October, you add 16 hours, in November you add 16 hours, and so on. As you get close to the 240-hour cap, you can see that you need to use some vacation time.

Even though employees will normally accrue leave on a monthly basis, employees with ten or more years of service who retire or terminate during the fiscal year will receive the remaining accrual for the year, just as they do today.

The new policy does not affect earned vacation as such: Nonrepresented full-time regular employees hired prior to Oct. 1, 1993, still earn 192 hours per year; those hired after that date earn 120 hours per year during their first ten years of employment. Part-time and nonregular

Vacation donation plan enables Sandians to help colleagues during family emergencies

Under a new Labs policy, nonrepresented Sandians with unused vacation can donate the time to a fellow nonrepresented employee who has an emergency requiring him or her to miss work and otherwise not get paid.

The "vacation donation plan," implemented by Human Resources Div. 3000, is intended to assist Sandia employees faced with extraordinary circumstances. Under the plan's rules, personal emergencies that qualify for donated vacation time include:

- Medical emergencies of a family member.
- The death of more than one family member in the same fiscal year.
- The post-funeral matters related to the death of more than one family member in the same fiscal year.

"Every now and then, employees find themselves in an unusual, extraordinary situation," says Div. 3000 VP Charlie Emery. "When something like this comes up, the last things we want them to do is worry about whether they're getting paid."

The plan, says Charlie, "provides an excellent avenue for Sandians to help their fellow employees."

Who is eligible

All regular full-time and part-time nonrepresented employees with at least six months of service are eligible to participate, either as vacation donors or recipients. Non-regular employees in the following programs are also eligible: post-doctoral appointee, faculty sabbatical, and non-represented limited term employees. Other non-regular employees are not eligible. The plan is being discussed with Sandia's bargaining units. An employee must use up all of his or her current year and carryover vacation, convertible vacation, flextime, and maximum paid personal leave eligibility before being eligible to apply for or receive donated vacation hours.

Vacation time can only be donated to and used by Sandia Corporation employees. No more than 160 hours of donated time can be used by a recipient in a calendar year. And it must be used only for a qualifying emergency (see above).

Donated vacation time does not have to be used consecutively, but may be used on an

intermittent basis, as long as it is used for the same qualifying emergency. However, the donated time cannot be used retroactively for days already taken without pay and may not be received or used after the qualifying emergency ends or the post-funeral matters have been handled.

An employee may donate up to 40 hours of vacation time (in half-day increments) to any one vacation donation recipient. Vacation will be deducted from the donor's account as it is used by the recipient.

The process

When an employee is confronted with a qualifying emergency and has no paid leave options remaining, the employee's supervisor should notify the Division 3000 administrative assistant of the situation. Either the supervisor or the employee will complete an application form and submit it to the HR administrative assistant. The application will be reviewed and a decision made after the facts of the situation are considered and leave balances are verified with payroll.

The employee will be notified of acceptance or denial. If the request is accepted, employees in the recipient's division will be notified of the special need, and donations of vacation time will be solicited. If not enough volunteers come forward from the recipient's division, notification will be made (if the recipient wishes) outside the division for donors.

"The vacation donation plan has been used effectively by other organizations and businesses," Charlie says. "What sparked my interest here was that we had a couple of incidents in the past few months where a vacation donation policy could have made a real difference.

"The new plan," he says, "will only affect a handful of Sandians each year. The numbers are small, but the plan will have a tremendous positive impact on those it is designed to help."

For information about the plan, e-mail or call Marlene Vigil (3343) at 844-5471. Additional information about the plan will be published on the Internal Web by the end of May.

— Bill Murphy

employees earn vacation and holiday hours according to set schedules.

According to Jann, the new policy:

- Places responsibility to control vacation on the employee.
- Is applied equally to everyone.
- Promotes healthier, more productive employees by encouraging regular use of vacation throughout the year.
- Eliminates manual adjustments.
- Eliminates exception and approval memos for carrying over vacation.
- Can be implemented in unmodified PeopleSoft.
- Meets legal requirements of all states in which Sandia has employees.

Around the corporation

Lockheed Martin government contracting taking on social services role

A recent Baltimore-dated *Los Angeles Times* profile of Lockheed Martin identified the company's burgeoning management services business as a seemingly unlikely growth focus for the world's largest defense contractor.

Chairman and CEO Norm Augustine pointed out in an interview for the story, however, "The largest and fastest-growing part of the federal government is in the social services areas, and there are lots of things that we can do to help the federal government."

The story referred to a LMC contract that has it working in Baltimore to track down 90,000 "deadbeat dads" — fathers who are not contributing to the support of their children — by means ranging from holding informal hearings to drawing blood to confirm parentage. That and similar social services work led a defense industry analyst interviewed for the story to say LMC "can thrive even if the defense budget erodes year after year. The nondefense side of this company may eventually become the core of the company."

Town meetings scheduled

A number of employee town meetings have been scheduled to address the vacation carryover issue and other changes in Labs business practices slated to take effect between now and Oct. 1. All employees are invited to attend the following sessions, to be held in the Technology Transfer Center auditorium (Bldg. 825):

June 12, 11 a.m.-noon (simulcast to California & Virginia). Topics: biweekly pay, vacation sell-back, vacation accrual, and sickness absence

June 17, 11 a.m.-noon (simulcast to California & Virginia). Topics: Same as above.

July 1, 10 a.m.-11 a.m. Topics: enabling technology (common operating environment, workflow technology, Employee Self-Service Benefits home page, etc).

Additional information is also available on the Internal Web at "Sandia's Changing Business Practices" Web site at <http://www-irn.sandia.gov/announce/scbp/mgrtm.html>

Sympathy

To Louis Nogales (5513) on the death of his mother, Elaisa Nogales, in Albuquerque, April 11.

To Herb (4900) and Rita (7821) Pitts on the death of his father and her father-in-law, Louis Pitts, in Chickasha, Okla., April 27.

NASA team makes pitch for Labs' help in human-crewed Mars missions

Robotic missions will pave way for crewed flights in 21st century

By Bill Murphy

Lab News staff

Sandia's expertise in power systems, super-computing, modeling and simulations, micro-machines, and other advanced technologies may soon come to the aid of NASA as it lays plans for a human-crewed mission to Mars in the second decade of the 21st century.

The team of NASA scientists and engineers designing the Mars mission visited Sandia to discuss areas of potential collaboration. The team was feeling out Sandia for possible involvement in addressing some of the formidable technical challenges of the Mars mission. This is the same highly visible NASA team, by the way, that was featured recently on the recent "Destination Mars" TV special on cable television.

The NASA officials — from the agency's Exploration Office — briefed about 50 Sandia technical counterparts about the agency's evolving plans for an ambitious two- to three-year human mission to the Red Planet. The NASA team was hosted by Roger Lenard of Deputy Director for Area 5 Dept. 9360 and Ron Lipinski of Nuclear Technology and Research Dept. 9363.

Before the NASA briefing, Jim Rice, Director of Environmental Technologies and Applications Center 6600, briefed the briefers, providing an overview of the Labs' technical capabilities and areas of special expertise.

Living off the land

The Mars mission as presented to Sandians represents a bold departure from the Apollo-era approach. In the Apollo model, a heavy-lift launch vehicle hoisted a self-contained, closed system to the moon and back. The Mars reference mission, by contrast, envisions a "living off the land," open-system approach.

As explained in the briefing, some components of the mission will be predeployed at Mars, much the way polar explorers and Himalayan climbers predeploy resources along their routes. For the Mars mission, planners envision establishing automated base camps on the planet that are capable of manufacturing propulsion fuels and oxygen from native Martian resources. The process is called, in mission-planner parlance, ISRU — in-situ resource utilization.

When human crews arrive at Mars some months after the automated factories are deployed, the breathable oxygen for their extended stay and much of the fuel for their

"The group from [NASA] is close to meeting Dan Goldin's challenge of finding an affordable Martian architecture."

return voyage will already be in place waiting for them, thanks to ISRU.

This is important: for every ounce of fuel and every ounce of oxygen not carried from Earth, there is capacity for an extra ounce of other mission-critical supplies to be carried aloft. Those supplies, in turn, mean a longer surface stay, more exploration, more science, more knowledge, and more adventure.

The NASA mission, with its automated factories, new propulsion systems, and demanding power system requirements, intersects neatly with several core Sandia capabilities.

"During the 1950s and 60s," Jim told the NASA representatives, "Sandia built up tremendous R&D [research and development] capabilities as the sole engineering laboratory for the nation's nuclear weapons complex. With the decline in weapons work, Sandia has begun to apply those capabilities to other challenges."

In his presentation, Jim displayed a chart indicating that Sandia's "work for others" share of revenue has been growing steadily in recent years. He made it clear that Sandia welcomes opportunities to provide its expertise in non-DOE challenges.

Meanwhile, NASA's Mars jocks — the hard-core "true believers" of human space exploration — have been under extreme pressure from administrator Dan Goldin to dramatically reduce costs for Mars missions. Goldin, though a "true believer" himself, also knew that to be politically viable, the cost of a human-crewed Mars mission would have to be reduced by an order of magnitude or more, from, say, \$400 billion to \$40 billion.

Seeking outside advice on how to meet the daunting Goldin challenge, the NASA team turned to a number of sources, including Roger Lenard at Sandia. Roger was well-known to the human space flight crowd at NASA, having been appointed by President Bush to the Synthesis Group, which studied human space flight options in the late 1980s.

A 'barrier to entry' overcome

"At the team's request, Ron [Lipinski] and I looked at how NASA might control costs for a Mars mission," Roger says. "It seemed to us that one of the key 'barriers to entry' [i.e., one of the most prohibitively costly requirements of a Mars mission as it was then conceived] was the need for a new generation heavy-lift launch vehicle."

Ron and Roger came up with a "flight plan" based on using a shuttle-derivative launcher [perhaps Lockheed Martin's VentureStar] combined with a space tug-type vehicle. The shuttle derivative would boost mission components into low-earth orbit. From there, a space tug would push the components to a high orbit. The very low-g, low-acceleration tug might take several months to lift components to high orbit, but could do so very efficiently. The advantage in the approach is that it is a lot easier — and cheaper — to achieve escape velocity from high orbit than from low orbit. If you can get to high orbit cheaply, then everything else about the mission suddenly gets a lot cheaper, too, Roger says.

But is there a viable space tug? In fact, one of the main reasons NASA was at Sandia was to check out the Labs' work with an industrial partner on just such a system.

"We are working with a commercial customer to develop a commercially viable, advanced in-space transportation system [space tug] that is directly applicable to a [human-crewed] Mars space mission," Roger says. "The NASA folks were here to satisfy themselves that an efficient space tug is not just a paper exercise but is a technical and business reality. I think they went away very satisfied."

As intriguing as the space tug concept is —



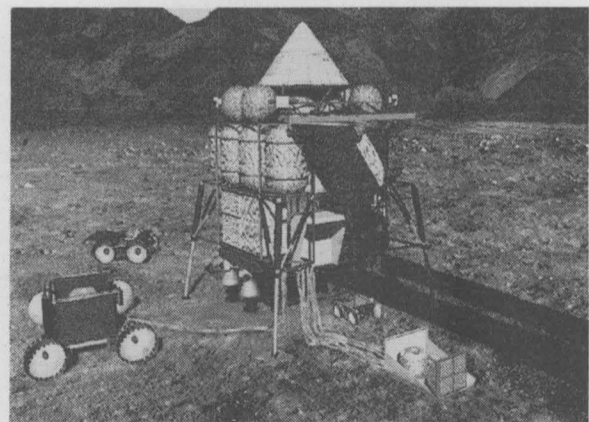
and as important as it may prove to be in any eventual human trip to Mars — the real key to the mission is power, says Roger.

"The central issue," he says, "is that if you go to a new world that doesn't have running water, doesn't have a breathable atmosphere, doesn't have food, then you need power to provide those things [via automated factories]. Candidly, there is only one source for that kind of power and it isn't the sun."

Ron Lipinski fleshes out Roger's point: "The group from the Johnson Space Center is close to meeting Dan Goldin's challenge of finding an affordable Martian architecture," Ron says, "and compact nuclear power sources are an essential component of that architecture."

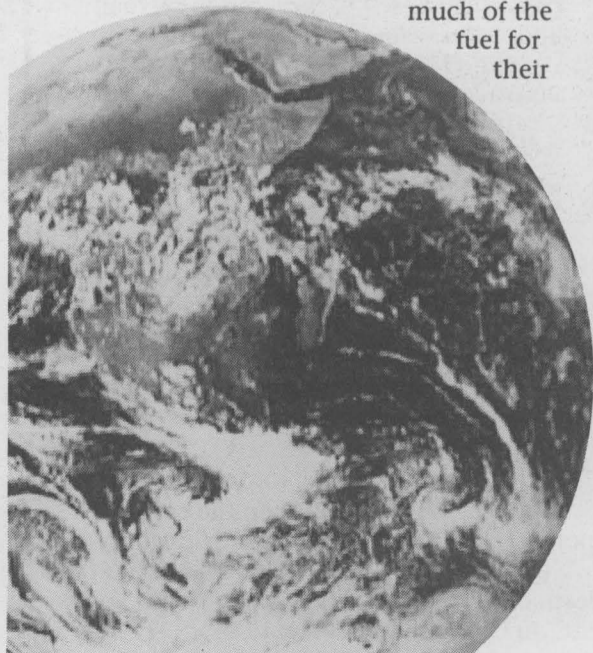
"Sandia's extensive nuclear expertise will enable us to play a pivotal role in the human exploration of Mars. We could potentially become the lead lab for the development of nuclear electric sources for cargo transport to Mars, for converting Martian atmosphere into rocket fuel, and for long-range Martian rovers. Additional Sandia roles might include supplying radiation-hardened electronics, microsensors, aeroshell design, parachute design, and robotics."

"It was a pleasure to see a dynamic NASA team with the vision and determination to get to Mars," Ron says. "The NASA team seemed very pleased with the meeting and excited about future interactions."



LIVING OFF THE LAND — An automated "factory," such as the one shown in this artist's conception, might be predeployed to Mars as a precursor for a crewed mission. The plant would convert martian resources into fuel and oxygen. Such a facility would require a compact and robust power source, an area where Sandia might collaborate with NASA. (NASA image)

A note about the images on this page: The image of Earth at left was made by Apollo 17 astronauts in 1972. They were the last human crew to travel beyond earth orbit. The image of Mars (top) was made by the Hubble Space Telescope this year. With a pixel resolution of 13 km, it is the most detailed image of Mars ever made from the environs of Earth.



Pat Eicker receives world's most prestigious robotics honor

Sandia robotics director cited for leadership in creating premier center for robotics research

Pat Eicker, Director of Intelligent Systems and Robotics Center 9600, has been named the 1997 recipient of the Joseph F. Engelberger Robotics Award for leadership.

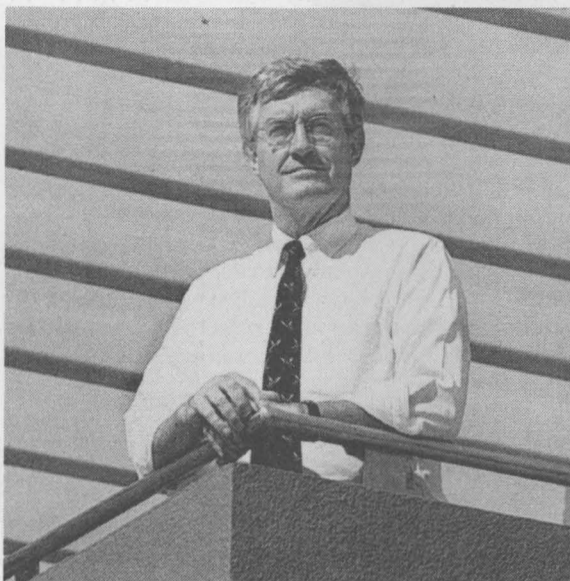
The Engelberger Robotics Award, deemed the world's most prestigious robotics honor, is awarded each year by the Robotic Industries Association in four categories — leadership, technology development, application, and education. The leadership award recognizes outstanding individual contribution to the robotics industry. Candidates must be well known in the international robotics community for their ongoing dedication, involvement, and leadership.

"Your leadership in establishing the Intelligent Systems and Robotics Center at Sandia as one of the world's premier centers for robotics research, and the excellent work you are doing to bring the Robotics and Intelligent Machines Coordinating Council to fruition, is being recognized by the presentation of this prestigious international award," said Donald A. Vincent, executive vice president of the Robotic Industries Association.

The award, presented May 12 in Detroit, is named after Joseph F. Engelberger, known throughout the world as "the father of robotics." Engelberger was founder and first president of Unimation, Inc., the world's first industrial robot manufacturer. He also was a founder of the Robotic Industries Association in 1974.

Pat has been Director of the Intelligent Systems and Robotics Center since 1992 and was instrumental in the development of Sandia's robotics program in the mid-1980s. He earned a doctorate in mathematics and statistics from Colorado State University in 1969.

"Receiving the award for leadership versus one of the other categories is particularly gratifying since I take very seriously the responsibility of a national laboratory to provide leadership, in the



PAT EICKER

national enterprise as well as in specific technical areas," Pat says.

150 researchers in program

He says the award also recognizes the quality of the robotics program's 150 multidisciplinary researchers who work closely with DOE, industry, and universities to develop applications for national security, environmental cleanup, and the nation's growing industrial and technological needs.

Last October, Sandia dedicated a new \$33-million, 73,000-square-foot Robotic Manufacturing Science and Engineering Laboratory (RMSEL), the largest robotics research and development program in the US. The center is unique in its integrated approach to developing application solutions and is a world leader in research and development of system software

and information architecture, automated planning and programming, and sensor and model-based control for intelligent systems.

The center develops diverse applications that range from manufacturing, materials handling, remediation of environmentally contaminated sites, to battlefield robots. In the area of industrial applications, Sandia has developed intelligent machines to carry out such diverse tasks as packaging, painting, chemical and physical characterization, cleaning, assembly, disassembly, soldering, explosive powder dispensing, and deburring/edge finishing.

Pat also was instrumental in organizing the National Needs Workshop on Robotics held immediately after RMSEL's dedication to identify barriers to wider use of automation, and to formulate plans to overcome them. About 70 robotics experts from throughout the country representing industry, vendors, universities, and the national laboratories attended the workshop, which was sponsored by the National Science Foundation and DOE.

The workshop provided a big step in solidifying support and cooperation among all segments of the robotics and intelligent machines community, from users and suppliers to those involved in research and development. The workshop also helped firm up support among policymakers in Washington for a national robotics and intelligent machines initiative.

A white paper summarizing workshop discussion and accomplishments was issued late last year by the workshop's organizers: The Robotics and Intelligent Machines Coordinating Council, composed of members from industry, universities, and government; and a joint committee of the Robotic Industries Association and the IEEE Robotics and Automation Society.

—Chris Miller

National magazine, newspaper ads highlighting Sandia technologies

Sandia technology is getting some big-time visibility in national publications this spring.

Two provocative, double-page, glossy Lockheed Martin corporate ads featuring Sandia's virtual reality and robotics technologies are appearing in East Coast editions of *USA Today*, *The Wall Street Journal*, *Time*, *Newsweek*, the *Washington Post*, the *National Journal*, and *Congressional Quarterly*. The ads are appearing in various issues of these publications from April into mid-June.

"The doctor will fly through your brain now," the first ad declares in bold type, superimposed over an image of a human brain.

Here's the rest of the text: "Mission: A new technology called MuSE will soon help surgeons increase their accuracy in the O.R. by letting them pilot a 'virtual craft' into a highly realistic simulation of the patient's brain before operating. The MuSE system, developed at Sandia National Laboratories, uses high-performance computing technology and has implications for fields as diverse as manufacturing, education, and astronomy. Success: MuSE is just one of many life-enhancing applications to emerge from Sandia's Computational Sciences, Computer Sciences, and Mathematics Center. But it's a perfect example of the way in which Sandia, operated by Lockheed Martin for the Department of Energy, is finding practical solutions to our nation's most challenging problems. Including a medical exam we passed with flying colors."

"Go ahead, throw acid in his face. He won't mind," declares the second ad in bold type.

Here's the rest of its text: "Mission: Dangerous substances aren't exactly the sort of thing you want your people exposed to. That's what robots are for. Intelligent machines and robotics play a critical role in potentially hazardous work

such as the remediation of toxic waste materials. And U.S. industry is continually discovering new robotics uses in fields from manufacturing to medicine. Success: Sandia National Laboratories, operated for the Department of Energy by Lockheed Martin, recently opened one of America's most advanced robotics research centers. Virtually all the work performed there has direct applications to industry. The facility is just one of many ways the National Labs contribute to our quality of life — by serving as America's R&D Department."

Sandia assisted in the preparation of the ads, which were designed and placed by Lockheed Martin's ad agency, DDB Needham. Jerry Langheim, VP for Communications at the Lockheed Martin Energy & Environment Sector in Albuquerque, proposed the ads to corporate headquarters. The ad texts and images were then prepared in consultation with Employee Communications and Media Relations Dept. 12640; Computational Sciences, Computer Sciences, and Mathematics Center 9200; and Intelligent Systems and Robotics Center 9600.

Here are answers to your questions about the IJS

Stealth quotas, Labs-wide equity are employees' primary concerns about the Integrated Job Structure

Last issue we asked Lab News readers to submit to us their burning questions about the new Integrated Job Structure (IJS). Below are your questions and impromptu answers from Human Resources Director Don Blanton (3500), Compensation and Job Evaluation Manager Ed Cassidy (3545), and IJS project leader Kirsten Randolph (3545) obtained during interviews by senior editor John German May 15 and 16.

Because of the number of questions, we aren't able to publish all the questions and answers in this issue and still provide other news. Below are most Qs & As addressing the IJS in general, quotas, cross-organizational consistency, interpretation of the placement criteria, and managers' freedoms in placing employees. Look for the second installment in two weeks — in our June 6 issue — to include questions and answers about promotion, salary, and the job ladders and categories themselves. If you don't see your submitted question (or a similar one) here, look for it on June 6.

General questions about the IJS

Q: Why are we doing the IJS? What is the value to our DOE customer? Is there a contractual requirement to do this? Or are we trying to pattern ourselves after industry? If so, how is industry dealing with these problems?

Don Blanton: There are several reasons we're doing the IJS. First, it's a contractual requirement. When AT&T decided not to continue its contract to manage Sandia, and DOE put out its request for proposals, a requirement DOE placed on the new contractor was to be able to provide better links of salary to the market, primarily for technical salaries. In addition, it required a "job evaluation" system to apply to all classifications. That is written into our contract.

There are other good reasons for doing the IJS. Being able to categorize functions by occupation will help tell where we are underpaying people according to market standards, and that will help us justify additional compensation from our DOE customer where it's appropriate. It's also a best-business practice, and we are trying to become more commercial-like. That's not to say we are trying to become a commercial operation, but in trying to become more businesslike, we see that most large companies do use market-driven linkages for compensation purposes.

The basic principles of the IJS are borrowed from some of the best companies in industry, but the particular system we have adopted is customized to fit Sandia's needs. So line representatives along with compensation professionals benchmarked a number of companies and industries. We also utilized the services of a compensation consultant. The ultimate system the IJS team developed is one that is thought to be best for Sandia.

Q [from a manager]: I've been told that by the time the IJS is fully instituted, it will have cost Sandia about \$50 million. Is that true? No matter what the ultimate cost, please explain why that cost can be justified?

Q: Are the incorporation of the changes into the Sandia system significant enough as a viable tradeoff for the disruption, time, and money it will take?

Don: It's true there is a disruption associated with this significant change that I wouldn't want to minimize. And while there are costs for the time involved by IJS team members, managers' time spent in training, benchmarking, and consulting fees, they don't add up to anywhere near \$50 million. I don't know where the number \$50 million comes from.

I do think the real costs can be justified because what we're going to end up with is a much more flexible process that managers and employees will understand very clearly. Our old compensation process was kind of a black box, where jobs were evaluated in Compensation [Dept. 3545] based on an elaborate process and were imposed on the organization. Here employees and managers are going to fully understand the process. Managers are going to own the process supported by Compensation. So any time you can take a fairly

complex, mystical process and bring it to light and have everybody understand how it affects them, I think that's a significant improvement.

It's difficult to put a cost-benefit on this immediately, but over time I think the change will be worthwhile for the Laboratory. It will be a more streamlined system; managers will own the process by which employees are classified under this system; and we will be able to provide industry salary averages to managers so they can make better compensation decisions, so we can actually pay what a job is worth — or overpay what a job is worth if that's what it takes to attract and retain the kind of skills we are looking for at this Laboratory.

Q: Why haven't the Web pages been updated to reflect the changes in titles [to MTS and SMTS rather than TS I and TS II, for example]? It may not seem like a big thing, but it is annoying.

Ed Cassidy: We plan to incorporate at one time all of the changes that take place as implementation proceeds, most likely this summer. There is an explanation on the IJS Web page, and in the April 11 Lab News, about why and how the titles have changed. The feedback we have received is that most Sandians can handle doing the translation for now.

Placement limits/quotas

Q: Are there quotas on the number of people who can be placed into certain, higher level classifications in the technical, technician, and laboratory staff ladders?

Q: Are there supposed to be restrictions on how many employees per department are to be assigned to any one level, say the PTNG level? If not, then my department is not receiving the correct information.

Q: I was wondering why quotas were placed on the number of folks allowed for each ladder step. Is this corporate wide or just a division thing?

Q: The limits on the number of people who can occupy higher levels in the IJS seem to indicate that in order to be promoted, one must fit the level criteria and there must be room for the employee in the higher group. Is that true?

Don: There are no established quotas inherent in the IJS, other than the limitations on the numbers of employees at the "Distinguished" levels. Typically in any organization, you would expect certain distributions of highly skilled versus entry-level kind of people within any given classification. So one of the things we've done is provide managers some guidelines for what might reasonably be expected. But those guidelines should not be interpreted in any way as quotas.

A part of the IJS process was for managers and employees to sit down and come to some mutual agreement as to what they believed their level was, and that then would go forward as a recommendation. Those data are going to be looked at this month by directors and then by vice presidents to see if there appears to be reasonableness associated with the data.

At that point, there may be adjustment decisions made within individual organizations, but that would not be based on any type of prescribed quota. It would be based on vice presidents' judgments as to whether the level criteria have been properly interpreted and so forth. It would be up to the organizations as to what distributions of PMTS, SMTS, and MTS employees exist within a given department, center, or division.

So at a corporate level we certainly aren't advocating the imposition of quotas in any part of the organization. What matters is does the person meet 100 percent of the level criteria for a given classification. If they do, that's what they should be classified as. If they miss one of those criteria, then they should be placed at the next lower level.

Some managers would like to have quotas. In the four hours of manager training about how to interpret the level criteria and how to apply it, there were absolutely no limitations placed on the number within each level. If there are cases of strict quotas being used to place people, that's certainly not what managers were instructed to do. What individual

managers might be doing at this point in the process I wouldn't know about, but that may be something that needs to be looked at as the process continues to develop and mature, moving toward October [when the placements officially take effect].

Lab News: Is it OK, then, for managers to use some sort of quota?

Don: I don't think so, no. I don't think quotas are appropriate. If a person fully met all of the criteria for a given level, that's what they should be classified at, and they shouldn't be denied that classification just because they happen to go over the established or prescribed limits set by a given center director or manager. That would be contrary to the philosophy we're advocating.

On the other hand, we clearly want to make sure that every employee meets every criterion, and that we aren't being too generous or too liberal in interpreting the guidelines. That would be equally wrong. So a very stringent interpretation of the guidelines is appropriate. And if a person meets four but not the fifth criteria, they shouldn't be classified at the higher level.

The steps in the process call for the collected data to come to Compensation where it will be looked at based on a lot of demographic characteristics. Those data are going to be handed back to the VPs, and they will be asked to scrutinize the data. There may be, in fact, some changes — moving people up or down — as a result of that scrutiny. That's a stated part of the process.

LN: What is the "principal" designation supposed to be?

Don: In general, the "Principal" level should be used to designate an individual who is an acknowledged resource to the organization. Specifically, in the technical ladder, we've customized our levels based on Sandia's needs. Sandia under the current system had in effect three levels for technical staff — MTS, SMTS, and then DMTS. Based on employee survey data — and this goes back to the IJS teams' activities — we asked for input from all members of technical staff as to some of the attributes they'd like to see in an improved system. Overwhelmingly the response was "Another level built into the process," because it was felt there was a significant degree of difference within the SMTS population. This change was to be responsive to the feedback we received from the technical staff population that another level was desired.

Q: Is it true that Charlie Emery [VP of Human Resources Div. 3000] told the VPs if there are too many people in the higher categories, he is going to send them back to do their placements over? [Don deferred this question to Charlie.]

Charlie Emery [via e-mail]: What I have said is that if there are submissions [from a division] that seem to be [statistically] out of the normal trends in other divisions, then we would go to that division and examine the selection process. There might be a good reason for a deviation and there might not. We do not intend to go back to the entire population [and do placements over based on a quota]. No quota has been set. We will have to look at the data. Also, the SHRP [Strategic Human Resources Planning] committee is reviewing the data as well.

Labs-wide consistency/equity

Q: What guidance is available from executive management as to how they want the IJS uniformly implemented Lab-wide?

Q: Each of us in my department does the same work. We met with our manager and went over our job descriptions and unanimously decided what level we all are based on the guidelines we were given. Now we are told because some people had different levels of education, some had more experience, and the pay was too different, we are all at different levels. How is Sandia ensuring that management is implementing the IJS according to the guidelines that were given to employees?

Q: How will [Human Resources] ensure that MLSS are fairly and systematically placed in levels according to the written criteria? Will there be a blind test of validity and reliability performed across MLS ranks to ensure that we didn't, again, plug people in by who they are (as individuals) or what their salaries are already?

Q: We were told there are no quotas for how many
(Continued on next page)

"... those guidelines should not be interpreted in any way as quotas."

"It's difficult to put a cost-benefit on this immediately, but over time I think the change will be worthwhile."

(Continued from preceding page)
 people get into each classification, yet in every center where I have friends I hear that, in practice, just the opposite is true. In one center, "only a few" staff members will get PMTS. In another center, I'm told that "a certain percentage" of staff members will get PMTS. In my center, all of us are being submitted for PMTS (unless we're already DMTS, of course). What steps are being taken to standardize this over the Lab and make the de facto implementation match the officially stated guidelines?

Don: That's a part of the review process I'm referring to. When all the data are received and looked at at the division level, it is going to be up to the division vice presidents to see if the recommendations that resulted from the meetings between managers and employees are appropriate, or if there need to be changes. A part of the process is a review at the division level.

Then, after whatever action might be taken at that level, another part of the process calls for review with SQLC before we implement this in October. So there are several review processes in the system to deal with this issue of internal equity and fairness, and to ensure as much equity and consistency as possible. It's too early to tell yet how much balancing out will be required.

LN: So we are by no means finished. I think there's an impression that when you sign off on your IJS form, that's it.

Don: Oh, heavens no. Not at all. It could be changed downward; it could be changed upward. But you've got to remember, the preliminary agreement between the manager and the employee is strictly a recommendation that goes to the director and the division. It's not a final decision at that point. There is the potential for viewing the criteria differently. That's where training comes in. That's where assistance from Compensation professionals comes in. And we're going out in a variety of different ways working with organizations and managers right now to provide additional training.

I believe the interpretation of these level criteria will only improve over time. There may be some differences right now in interpretation. Hopefully that's caught at the first review level at the division. If not, over time, I believe this will balance out.

But the beauty of this process is the flexibility that's built in — being able to change decisions. It's not like if a decision to classify an employee at a certain level has been made, then all of a sudden the manager is locked into that indefinitely. If there's some evidence that a manager has made an incorrect decision, that decision can be changed.

It's probably going to be two or three years before this process really becomes comfortable. I recognize that this represents a significant change, not only for Sandia but for any company that chooses to go this route. Before, we had a very inflexible, prescriptive process for determining job levels. Now we've gone to a more open, less restrictive, more flexible process. And we're shifting the responsibility for decision-making from a group of staff professionals in Compensation to the line organization with the support of Compensation. That represents a big cultural change, and no, we won't be fully matured by October. I think two to three years is not unreasonable. By that time, we'll be settled in. In the meantime, we'll constantly be monitoring the program to identify ways to improve it.

"It's probably going to be two or three years before this process really becomes comfortable."

Q [from a manager]: Who is going to respond to the lawsuits and EEO [Equal Employment Opportunity] charges when managers — who have had limited job evaluation training and have no broad knowledge about work being done across the Labs — classify their employees higher or lower than employees doing similar work in other organizations?

Don: I sincerely hope that we do a good enough job of communicating, educating, and working with managers that when we actually get to the point of implementation in October, some of the apprehension and fear and uncertainty about this whole process will be reduced significantly to where this isn't as large an issue as some believe it is right now.

On the other hand, certainly, employees have options they can exercise if they believe they've been discriminated against. We're going to be very

sensitive to this issue, just like we are currently. That's where we'll be working closely with the line managers to ensure that as much fairness and equity have gone into their decision-making as possible. But when the ultimate time comes, and if this is something that confronts us, we'll deal with it in the same way we would respond to it today.

As far as managers' abilities to make these determinations, the IJS system relies heavily on the job knowledge of the individual managers. That was not a decision made independent of the managers, and their input always greatly influenced job classifications under our current system. So managers weren't removed from our current system; it's just that the responsibility was on the Compensation group to come up with an ultimate decision. The difference now is that the balance of decision-making has shifted from Compensation to the line manager where it properly belongs.

There's still going to be ample help and counseling provided by the Compensation organization. We'll be providing managers with comparative data

The IJS staff ladders

Integrated Job Structure titles

Technical Staff Ladder:

DMTS (Distinguished Member of Technical Staff)
 PMTS (Principal Member of Technical Staff)
 SMTS (Senior Member of Technical Staff)
 MTS (Member of Technical Staff)

Laboratory Staff Ladder:

DMLS (Distinguished Member of Laboratory Staff)
 PMLS (Principal Member of Laboratory Staff)
 SMLS (Senior Member of Laboratory Staff)
 MLS (Member of Laboratory Staff)

Technologist Ladder:

DTNG (Distinguished Technologist)
 PTNG (Principal Technologist)
 STNG (Senior Technologist)
 TNG (Technologist)

to help them formulate their decisions, not only about their own organizations but about how others across the Laboratory view given job assignments and positions.

Q: In our groups, I've heard that managers are using the IJS as a tool to move employees forward in their careers while others have said they are positioned the same as they are now. Is this just the manager's best guess for positioning a person?

Ed: I think the real issue is whether the level criteria are applied consistently in an organization, and that should be the full measure of it. Managers need to be appropriately positioning people using the IJS level guides. It's bad to overclassify and to underclassify in terms of an employee's career and career opportunities. Don't just promote to promote your own employees.

Kirsten Randolph: If managers want to help their people advance, they can use the level criteria as objectives for professional development. Maybe you've checked across that you're a "principal" in four out of five categories, but one category was "senior," so you ended up at the senior level. That's a golden opportunity for the manager to help facilitate getting the right assignments to help the employee become what he or she aspires to. Everybody has to take ownership for careers, and I think the primary responsibility is the employee for their own career. But the manager should play the role of facilitator.

Ed: That's right. Employees under this system have a lot bigger stake in understanding what's required for level movement or occupation movement, and the reality of work today in the United States is that careers are more horizontal; they aren't necessarily up.

Kirsten: As far as being positioned the same as you are now, what some groups have done is try to check back with the old structure. Realize that not everything about the old structure was wrong. There was some credibility with why people were at different levels. Some groups have gone back to see if where people ended up based on the level criteria made sense intuitively. I don't see a problem with that. What we've told managers is to go by the level criteria as the primary tool.

Ed: But you wouldn't want to automatically place people at the same levels. As an example, one

organization listed on one side the current MLS levels from two through seven and then the four IJS levels for Laboratory Staff on the other side, and they arrowed where employees for each level went. The arrows fanned out from each of the MLS levels to the IJS levels. Intuitively that tells me that the level criteria are governing the process.

Q: What time frame should be used for documentation and ranking of your activities according to the level criteria? I was told immediate current job, but others have gone back to previous assignments 3, 4, 5 years ago. For example, I'm currently directing a small project that is not particularly "multidisciplinary," so I don't meet that criteria for PMTS, yet I have directed projects (\$1M) or tasks (\$5M+) on projects that were multidisciplinary, but that doesn't seem to count in this process. Is this consistent across the Labs or is this too narrow and an "under-ranking" or are others possibly being "over-ranked"?

Ed: Essentially you have to give yourself some time span here. It has to do with the bulk of your activity in the recent past and how that's defined. I think the time span that has been suggested by the SHRP committee is from now back two or three years. The real issue is what has the bulk of your activity been in the recent past and, more importantly, what it is going to continue to be in the near future. If there's been a significant change in your activity, maybe it's too early to tell where you ought to be reclassified. You have to make an assumption that you'll continue to be working at that level, especially if your assignment level is dependent on funding. I'm expecting that most managers will use a two- to three-year time span.

Kirsten: As implementation moves forward, we'll have to see what emerges as a Labs-wide standard for the reasonable time span to reclassify someone downward. You might look at a two-year span, or you might look at a five-year span. Likewise, what will emerge as an upward standard. In that case, there has to be a sustained demonstration of your ability to work at the higher level. For now, we'll be looking at the placement statistics, and if some deviations exist and those deviations appear to be the result of this time-frame issue, we'll have to help determine a standard.

LN: It sounds like this cross-organization equity issue will be looked at, at least corporately, based on statistics developed from the placement data. What is the process by which an individual employee who feels he or she hasn't been placed appropriately can bring their situation to the attention of upper management?

Ed: Each preliminary assessment form has a box employees can check that they don't concur, and they should attach their reasons for nonconcurrency, and that goes up the management line. The nonconcurrency is going to get known.

Kirsten: What we're asking is that people work through the normal line channels, but there are other resources. I've had lengthy discussions with many of our Human Resources Representatives and Customer Service Managers who are already working those kinds of issues, so employees can at least have some dialogue and understanding about their situations. In a lot of cases, it comes down to this interpretation thing: How I interpret the criteria is not necessarily how my manager or director interprets them.

LN: Some employees who submitted questions also commented that they feared retaliation if they appealed their placement. What should they do?

Ed: If an employee sincerely feels he or she has been placed inappropriately and can defend this point of view, there are alternate approaches, including the Ombuds. That's a real issue, and I don't dismiss the problem. I think there are cases where a manager may be more approachable than an employee perceives. But if indeed you're dealing with someone who is patently unfair, you're probably not the only one with that opinion. So if an employee is so intimidated that they don't even want to indicate their nonconcurrency on the IJS form, then they really need to explore some alternate approaches. Let me point out that such a case probably isn't a problem with the IJS itself but is a larger issue.

Placement criteria

Q: Wasn't this exercise supposed to put people at their level — not by their degrees, not by their years of experience, not by their mentor's influence — but by their work and the merit of their work?

Q: Why are employees being placed in a level according to salary, or current position, or education — factors we were told were not to be considered?

Q: I have heard that several departments are basing
 (Continued on next page)

(Continued from preceding page)
 their decisions on education, current pay, experience, and quotas. Did management get different guidelines than the employees?

Don: Managers and employees received the same guidelines. Those factors [education, current pay, current position, etc.] are not part of the IJS placement criteria. Factors like education and experience certainly might influence a manager in making a judgment relative to a person's skill level, but those criteria alone shouldn't be used to differentiate among people. And certainly, current pay and quotas are not a part of the process and shouldn't be used. I'm not aware of them being used exclusively, but they shouldn't be if they are.

LN: Are managers who are placing people incorrectly using quotas and other noncriteria factors going to have to go back and do this over?

Don: They could, if they ended up with a faulty decision. In other words, if they have a PMTS in their organization but they've classified that person as an SMTS strictly because that would have given them one too many PMTSs, that's the wrong decision, and that should be corrected.

We have heard of a couple of instances where managers have made decisions based strictly on years of experience and so on. We've gone back and said that's not right. I'm hopeful that those instances have been corrected. If they haven't, they will be. We're not going to have a system where you use level criteria to slot people and then some managers just arbitrarily decide they're going to use education and years of experience and ignore the criteria. That's not going to happen. But we'll only know that after the data comes in.

Q: In my center, individuals with a [certain number of years of experience] were not even considered for placement at the PMTS level, even if the manager felt the level criteria were met. How is this center policy consistent with the information we received about IJS which stated that individuals were "placed according to knowledge, skills, and abilities" and that placement was supposed to be "a fair and equitable classification of employees doing the same work"? Also, is this [years of experience] policy fair if it wasn't implemented Labs-wide?

Don: It's not. I agree with the questioner there. And if we find instances of that, that's one of the things we will monitor as a Human Resources organization in order to ensure consistency across the Laboratory. That's not consistent with the IJS guidelines.

Q: I was told that the published requirements for a PMTS were more geared for an R&D group, and therefore [my] management came up with their own set of requirements [which included] such things as "high visibility" and "acting enthusiastic." Are individual centers allowed to disregard the published list of qualifications for the various job categories and create their own list?

Don: No.

Q: Reasonable explanation has not been given for how an employee is to move to the next highest level in the absence of quantifiable criteria for acceptance to that level. What are the hard, quantifiable criteria for placement in a given level? Who determines the criteria (for example, criteria in Div. 1000 cannot be the same as in Div. 2000 due to the differences in the type of work performed)? Why do the "current criteria" apparently vary from person to person?

Ed: I'm aware that this is not a quantitative system in the sense that it's not a numerate system. But it does have a consistency of applied judgment. Essentially the level criteria are uniform and should be applied uniformly throughout the Laboratory. You might expect some differences in the levels different organizations place people in. Mainly that has to do with differences in the work in the organizations and what it takes to get it done. So the only hard-and-fast rules I can point to are the level criteria. If you must have quantifiable numbers, then you need to meet all the criteria in five out of five categories to be placed at that level. If it's four out of five, you don't meet the criteria for that level.

Q: Is placement in certain job structures based on your current salary a legitimate criteria? If the answer is no, what steps are being taken to assure that management is not utilizing this criteria, and what is the official avenue to challenge placement based on this criteria? [For information about challenging individual placements, see Ed's answer immediately before the "Placement criteria" section on page 9.]

Ed: The official answer is no. Salary is not a legitimate criterion. Meeting the level criteria is the criterion for placement.

Kirsten: The IJS salary bands are very broad and overlapping by design. Unless someone specifically brings it to our attention that their managers are placing them exclusively by current salary, we'll expect that this is not being done.

Q: Several of the PMTS criteria ("Advice is sought throughout the company," "Acknowledged as a laboratories resource") have been interpreted to mean that a technical staff member must have customers and be well known within the Lab before promotion to PMTS. Are these criteria applicable and/or achievable for those staff members that work solely with customers external to the Lab?

Ed: In terms of the PMTS, I think the issue here is that in order to be at the principal level, even if a person works exclusively with outside customers, their technical expertise might be such that they are known for bringing funding into the Laboratories, or they are an acknowledged expert in their technical field — if not within their vice presidency or center, at least within their department. This is where time at Sandia and the person's general renown comes in. Somewhere on this scale, your name gets to be known, if you will. At some point, you become a resource to the Laboratory, and that's what we're trying to get at here.

So yes, I think these criteria are applicable and achievable to technical staff members who work solely with customers external to the Lab.

Q: Is it right for employees who have recently been hired (less than 2 months) to be placed as Principal Technologist while employees who have worked over 10 years and worked different disciplines be placed as [Senior Technologist]? Shouldn't new employees have to prove themselves for at least a year?

Don: We've given the authority for classification in this case to the manager, and it's based on the skills and abilities an employee brings to the job they're assigned to. If there's some prior work history or work performance outside of Sandia, and that qualifies the employee to enter into Sandia at, say, a second-tier level, that's appropriate under our current system. We shouldn't penalize new employees who have the ability to perform on a level with longer-service employees by forcing them into lower levels. It's up to the manager to make that determination.

Q: Are "time in grade" or years of experience official factors for placement, or are some centers using them as criteria inappropriately? If one meets the level criteria outlined in the employee packet, does that mean they'll be promoted?

Kirsten: I think "time in grade" and years of experience are considerations that may be used to help demonstrate this concept of sustained performance at a certain job level. You can't demonstrate sustained performance unless you factor in some sort of time element. But they aren't intended to be used exclusively to place someone, and we haven't said someone needs to be in a position for X number of years before they can be promoted. But no, those are not official factors.

Q: On page 24 of the employee packet there is a table called "Education and Experience Guidelines." For internal movement to the TS I [Technologist] or MTS level, the following requirements are published: "Meets level criteria" and "Bachelor's/Master's degree in applicable field and/or equivalent appropriate experience at this level." I understand this to mean that an STA with an Associate Degree and "equivalent appropriate experience at this level" can be considered for placement at the MTS level. However, I'm told that at least some directors are saying that one must have a degree to be placed at the MTS level. . . . Are senior technicians who are doing engineering and project work ever going to receive equitable salary consideration?

Ed: It's always been possible at Sandia for someone without the academic credentials to get to the professional level through a combination of education, experience, and self learning. The real issue is whether you meet the level criteria and, more important, whether you can compete in doing the same kind of work that's expected at the professional level with the people who have degrees. It's a

decision that is made based on an individual's qualities. Out of a population of about 3,100 MTSS there are approximately 400 MTSS with an associate's degree or less, so it's a small percentage, but it's a possibility. Recognize that the nature of Sandia's work requires a certain level of education to cope with it, and that's reflected in the level criteria.

If a manager or director made a blanket statement that nondegree staff members couldn't be considered for professional-level placement, I would suggest that he or she wasn't really thinking it through. That's not the intent of the IJS.

Q: The justifications given for why many SMTS employees could not make the PMTS grade were extremely lame. These results appear to prove that the real purpose of this exercise was to downgrade SMTSS by decreasing the SMTS salary midpoint. I would like to know how the IJS process can have any credibility whatsoever when the level chart criteria were blatantly manipulated, and even discarded, by some organization managers in order to reward some employees while, in essence, punishing others.

Ed: There are a lot of assumptions made here. This person's perspective may be true for him or her. But by and large, the managers that I've dealt with — even those who don't necessarily agree with the value of the Integrated Job Structure — at least have been honest enough to follow the process, to apply the criteria as they're written, and they're not going to try to "game" the system.

Kirsten: Also, let me add that those salary bands are in flux as we refine them toward implementation. They may look somewhat different in October. The midpoints used during manager training were a proxy for demonstration purposes.

And keep in mind that we've added a level to the technical staff ladder — PMTS — into which many of the higher-paid current SMTSS will undoubtedly fit. So there is going to be a shifting of the population. Statistically, this might indeed have the effect of lowering the SMTS salary midpoint. The good news is that SMTS isn't the end of the road anymore.

Final placement determination

Q: The override of my manager's recommended classification indicates to me that his opinion carries little weight and can be minimally considered in the final classification decision. Why have managers classify people if their "recommendations" don't make any difference in an employee's final placement? What is the process for "final" analysis and classification?

Q: According to the IJS FAQ [frequently asked questions] on the Web, the implementation of the IJS is to be equitable and consistent. When I filled out my placement form I was told I was to be placed as a principal technologist. I have 20 years experience at the corporation, 7 as an STA, and I also have a BS degree. I signed the form and thought that was the end of it. Yet two weeks later I was called into my manager's office and told that now I was going to be placed as a Technologist II [Senior Technologist]. I have heard that other directorates accept the manager's placement while others don't. Why does this inconsistency among directorates exist?

Q [from a manager]: Early information about the IJS advertised a number of key points about the new system. One was that managers would have the responsibility for — in fact, be trusted to — analyzing their staff members' jobs and placing them appropriately in the new structure. Is that true, or are there other restrictions on a manager's freedom?

Don: Just as in any organization, there is a chain of command, so to speak. The process was set up for the first-level management to evaluate employees' skills and contributions — because they're the most knowledgeable. And in most cases, assuming they've adhered to the criteria, their decisions will not be changed.

But it's an important part of the process for higher-level management to have a say, because they've got a broader field of vision in the organization. To deal with this issue of equality across organizational lines is the reason a second- or third-level manager must be able to change the recommendation of a first-level manager. So department managers don't own this process by themselves. Line management owns this process. In every organization, higher-level managers have the authority to change the decisions made by lower-level managers where it's in the best interest of the organization. Before this occurs, however, the managers should talk, and there should be a clear understanding about why the change is being made.

Look for more questions and answers about the IJS in our June 6 issue.

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

- VIDEOTAPES, "Dick Tracy" and "The Rocketeer," like new, \$5 per tape. Rockwell, 884-4206.
- KITCHEN TABLE, maple, 4 chairs, \$100; love seat/twin hide-a-bed, \$90; white china, 8-piece setting, \$50; refrigerator, \$80; Rechar, 292-1754.
- KITTEN, 8 weeks old, male, orange tiger-patterned, box-trained, will play for food & keep, free. Crafts, 831-5234.
- STAR WARS COLLECTION, action figures, books, games, trading cards, magazines, patches, posters, toys, \$2,300 OBO. Beegle, 298-0330.
- BASIC MATHEMATICS (7TH ED.), *Introductory Algebra, Student's Solutions Manual*, all Bettenger/Keedy; paid \$49.20, \$49.20, \$17.89, asking \$23, \$23, \$9. Baker, 888-4220.
- NEW 486 COMPUTER, 16MB RAM, \$400; new Kid Proof 20-yr. carpet, 10' x 12', smoke blue, \$300; large red landscape rocks, \$1 ea. Chavez, 833-6055.
- EXERCISE EQUIPMENT, New York barbell, heavy-duty, free-standing chinning/dipping/leg-raise unit, 7'x3'x5', \$125. Sikora, 821-1983.
- CAL SPA HOT TUB, seats 5-6 people, \$1,500 OBO. Gilbert 892-1963.
- BREITLING AUTOMATIC WATCH, stainless steel, 1-1/2 yrs. old, excellent condition, \$500 OBO. Petersen, 275-7467.
- OFF-ROAD MOTORCYCLE BOOTS, SIDI, size 10, worn once around the block, \$100. Olsson, 821-8348.
- 486 COMPUTER, w/monitor, 100MB hard drive, 6MB RAM, Windows 3.1, Turbo C++ for Windows, \$500 OBO. Budge, 881-4263.
- EXERCISE MACHINE, Weslo Cardio Glide Plus, 1.5 years old, excellent condition, \$150 OBO. Figiel 856-0042.
- FULL-SIZE POOL TABLE, excellent, w/slate top, new felt and bumpers, you move it, \$800. Dodson, 332-3779.
- KING-SIZE WATERBED, w/6 drawers & bookcase headboard, waveless bladder, excellent condition, \$250. Wackerbarth, 281-3207.
- UTILITY TRAILER, 5' x 10', single-axle, 18-in. side panels, licensed & registered, \$575. Lesperance, 281-4921.
- WEDDING DRESS, new, by designer Bianchi, ivory color, silk, size 8, \$450 OBO. Treadwell, 898-7679.
- ALTO SAXOPHONE, student, new pads, w/case, \$300; "boom box," two 15-in. woofers, 250-watt, 4-ohm, \$150. Aguilar, 238-0567.
- TWO-HORSE TRAILER, new tires, \$1,200; English saddle, 16-1/2", \$220; Western, \$125; man's Regal AT bike, \$85. Baker, 856-6228.
- FERTILIZER SPREADER, drop-style, \$10. Smith, 299-6873.
- INDOOR PLANT, 7-1/2-ft. Norfolk pine; foreign stamp sets, airplanes, more. Montoya, 986-4252.
- BALDWIN ORGAN/FUN MACHINE, excellent condition, used once, double keyboard w/foot pedals, paid \$2,400, asking \$2,000 OBO. Macias, 242-3049.
- COPPERTONE REFRIGERATOR, \$100; Cardio Glide exerciser, \$100; microwave, \$50. Edmund, 881-7974.
- TIRES & WHEELS, set of 4, Dodge van, 5-hole wheel, like new, \$450. Wallace, 294-2870.
- ELECTRIC STOVE, GE, new, \$250; furnace, 100,000 Btu, lower withdraw, new, \$300. Maldonado 873-3206.
- OLD FASHIONED SCHOOL DESK, excellent condition, \$50. Benjamin, 294-3228.
- QUEEN BED, complete with mattress, \$300; Wellbuilt microwave, new, \$60. Hebron, 291-0884, ask for Bob.
- DINING TABLE, rattan/brass/glass, w/4 white cushioned chairs. Refrigerator, large w/lower freezer, all excellent condition. Pitts, 293-5481.
- STONEWARE, PFALTZGRAFF, complete set "village" pattern, 8 place settings with serving pieces, matching stainless flatware and glassware. Seyfer, 292-0179.
- MOVING SALE, Sat. 5/24, VCR, washer, dryer, entertainment center, more, 8203 Pickard NE (NW of Comanche/Wyoming), 8 a.m.- 3 p.m. Waggoner, 293-4755.
- SHOWER PAN, 34" x 60", \$50; large, new Airco cutting torch w/tips (no hoses/tanks/regulators), \$225 OBO. Zirzow, 281-9896.
- WARDS WASHER, HD, 4-spd., ivory, \$75 OBO; Wards dryer, HD, 4 settings, gold, \$75 OBO; both like new. Plummer, 823-1619.
- CERAMICS KILNS, Paragon, \$300; Alpine Industrial, \$700; antique kitchen wood stove, \$400. Sanchez, 343-8522.
- BIKE TRAILER for hauling kids, groceries, \$60; toy dump truck, push style for toddler, \$5. Forster, 293-7231.
- CHROME WHEELS, 15 x 10, progressive, 5-hole, 4.5-in. lug pattern, Alcoa look-a-likes, low miles, \$160. Teske, 822-9162 or 878-2108 pgr.
- DARK WOOD DINETTE W/CHINA CABINET, 4 chairs need some work, \$200. Nichols, 899-8532.
- EXTRA VACATION PKG to Florida & Bahamas, available with female companion, pay own expenses. Williams, 286-8263.
- ONAN GENERATOR, 4KW, 120/240 volt, 1800 RPM with recoil, electric start, custom trailer, \$1,000 OBO. Eaton 299-7271.
- DOGHOUSE, large, tan "Dogloo," never been used due to spoiled indoor sleeping dogs, \$50 OBO. Kesti, 821-9208.
- SOFA SLEEPER, Simmons, beige, excellent condition, \$175. Scott, 256-2553.
- FUJIFILM, outdoor disposable camera, 24 plus 3 exposures, great gifts for graduation, \$5/ea., nine total. Wagner, 823-9323.
- OAK DINING ROOM TABLE, 4 chairs, \$150; matching sofa, loveseat & chair, \$100. Spencer, 275-2091.
- COUCH & LOVESEAT, excellent condition, SW colors, \$250; Grey Corner computer desks, like new, \$60 ea.; 5-drawer desk, \$45. Miner, 828-1558.
- KILN, Skutt electric, cone 10, 7 cu. ft., \$300; Sears Free Spirit bicycle, 10-speed, \$25. Carlson, 897-1850.
- MAYTAG ELECTRIC DRYER, \$75; Maytag washing machine, \$100; both good condition. Dunlap, 884-0232.
- MAHOGANY DINING SET, French style, 40" x 60" table, 4 upholstered chairs, must see, \$150; steel office desk, free. Candelaria, 344-4596.
- TANDEM AXLE CAR TRAILER, 4-wheel electric brakes, chrome spokes, 14-ft. rails, long ramps, \$1,500. Whiston, 299-2046.
- KENMORE REFRIGERATOR, 4 years old, 20.6 cubic feet, top freezer with icemaker, almond color, \$349. Schkade, 292-5126.
- SEALED COUNTERTOP ELECTRIC RANGE; motorcycle helmets: one like-new, one used; newborn car seat, will deal. Schrader, 298-4154.
- PAINT SPRAYER, Wagner professional airless, used once, \$250; temp. electric role, \$75; Futon bunkbed, \$200. Schluter, 281-5954.
- TODDLER BED, white metal w/mattress, safety bar, \$30; beautiful ivory wedding gown, \$150. Quillman, 858-0363.
- BIRKENSTOCK CLOGS, w/6-1/2-7, brand new, \$50; Tony Little One-on-One trainer with video, \$75; brick cell phone, extras, \$60. Ayers, 888-8922.
- KING-SIZE WATER BED FRAME, free to a good home. Segalman, 262-2250.
- BEAUTIFUL, contemporary dining room table & chairs, \$350. Cossin, 262-0633.
- CRIB AND MATTRESS \$200, double stroller \$30, single stroller, \$10. Sjaardema, 299-8042.
- SMALL SWIVEL ROCKER, light tan corduroy fabric, good condition, \$45. Luikens, 881-1382.

TRANSPORTATION

- '93 NISSAN SE KING CAB PICKUP, 4WD, V6, AT, 51,300 miles, \$15,500. Gorman, 294-6014.
- '84 FORD BRONCO, 4-spd., 351 V8, collision damage, you move, best offer. Widler, 294-4263. '83
- FORD F150, 6 cylinder, 4-speed, manual, 128K miles, bedliner, gauges, original owner, \$3,200. Neugebauer, 294-1922.
- '92 SUZUKI SIDEKICK, 2-dr. soft top, 4-WD, CD player, 36,600 mi, \$6,300 OBO. Werner, 844-5983.

DEADLINE: Friday noon before week of publication unless changed by holiday. MAIL to Dept. 12640, MS 0165, FAX to 844-0645, or bring to Bldg. 811 lobby. You may also send ads by e-mail to Nancy Campanozzi (nrcampa@sandia.gov). Call Nancy at 844-7522 with questions. Because of space constraints, ads will be printed on a first-come basis.

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2. Include organization and full name with the ad submission.
3. No phone-ins.
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5. Type or print ad; use accepted abbreviations.
6. One ad per issue.
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8. No "for rent" ads except for employees on temporary assignment.
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- '94 FORD TEMPO, 4-dr., excellent condition, AT, AC, PL, AM/FM, new tires, new brakes, 45K miles. Milliman, 286-0508.
- '90 FORD AEROSTAR, XL extended van, 7-passenger seating, rear AC, trailer hitch, below NADA, \$5,975. Ferguson, 281-0135.
- '90 PLYMOUTH LASER TURBO, black, 5-spd., AC, AM/FM cassette w/equalizer, cruise, low miles, 1 owner, always garaged, great shape, \$6,150 OBO. Chapman, 296-4321.
- '96 FORD RANGER, XLT package, AC, 4 x 2, dark blue, excellent condition, w/tonneau cover, \$11,800 OBO. Thomas, 844-4410.
- '87 TOYOTA TERCEL, 4-spd., tinted windows, 130K miles, AM/FM cassette, \$800. Ward, 275-3023.
- '94 EXPLORER XLT, 4-dr., custom wheels, PW, PL, excellent condition, warranty available, \$17,400. Mulligan, 237-8005.
- '90 COUGAR XR7, supercharged, 3.8L, 77K miles, AT, power everything, leather, CD/JBL, moonroof, loads more, \$7,800. Brooks, 275-0056.
- '85 FORD RANGER, V6, long bed, AC, PS, PB, bed liner, new condition, \$2,800. Hanes, 292-6512.
- '90 BUICK RIVIERA, 120K miles, 1 owner, loaded, leather interior, \$8,400. Hindi, 296-6510.
- '74 DODGE TRUCK, 4x4, 281 2-barrel, AT, rebuilt engine, runs well, \$1,500 firm. Sanchez, 873-2058.
- '89 ACURA INTEGRA RS, 87K miles (highway), 1 owner, full maintenance records, \$5,995 OBO. Roesch, 281-9751.
- '86 FORD F-250, 460, AC, PS, 50K miles/overhaul, 4spd., clean, good condition, \$5,250. Eisenberger, 877-7041.
- '92 NISSAN PATHFINDER, 5-Spd., 4WD, AC, luggage rack, tow bar, 58K miles. \$13,000 OBO. Carroll, 292-5436.
- '93 DODGE GRAND CARAVAN SE, silver/red, some body damage, 90K miles, runs great, new shocks/struts/brakes. \$10,250. Barnette, 861-2451.
- '80 TOYOTA 3/4-TON PICKUP, showroom condition, must see to appreciate, \$2,700. Avila, 275-9572.
- '85 BRONCO II, 4WD, PS, PB, AC, 5-spd., new paint, clean, dependable V6, 24-mpg, AM/FM cassette, 2nd owner, \$3,750 OBO. Muirhead, 281-2925.
- '87 TOYOTA 4X4, w/camper, 5-spd., AC, CD, bedliner, 93K, excellent truck, under book at \$5,000. Keahbone, 831-6177.

- '92 FORD F-150 SUPERCAB, 8-ft. bed, 4.9 liter, 6 cyl., AC, PS, trailer tow pkg., bench seat rear, AM/FM, 5-speed, manual transmission, one owner, 52K miles, excellent condition, \$10,000. Boultinghouse, 281-1777.
- '95 DESIGNER CHEV. VAN, '89 Ford Bronco II, '74 Mercedes 450SL, '86 Car Caddy T2-1193; estate sale. French, 856-6126.
- '96 FORD RANGER, XLT, Supercab, AM/FM cassette, 4-spd., 4L, AC, two-tone paint, 12K miles, \$14,000. Manzanera, 836-4697.
- '73 LINCOLN CONTINENTAL MARK IV, loaded, good condition, \$2,500 OBO. Houser, 291-9645, leave message.
- '89 FORD AEROSTAR EB, excellent with everything, AC, trip computer, original owner, extended warranty serviced, 95K, \$6,200. O'Neal, 298-2859.
- '91 MAZDA PROTEGE LX, 4-cyl., 5-spd, PW, PL, power sunroof, 28/36-mpg, alloy wheels, CD, security system, cc/tilt, \$5,365. Martel, 293-1892.
- '91 FORD AEROSTAR XLT 4WD, extended, rear AC, AT, 84K miles, below book \$9,750 OBO; '90 Subaru Legacy, 4-dr. Sedan, AWD, 5-spd., PW, PL, sunroof, book value \$7,175, make offer. Loucks, 255-9444.
- '71 OLDSMOBILE 442 CONVERTIBLE, AT, AC, very nice condition, \$10,000 OBO. Loudermilk, 299-4621.
- '92 PONTIAC GRAN AM GT, red, DOHC Quad 4, 69K miles, 5-spd., AC, PW, PL, tilt cruise, 6-speaker AM/FM cassette, custom wheels, code alarm, excellent, \$9,000, OBO. Perez, 323-2144.
- '89 CHEVY BLAZER S10, 4x4, 5-spd., AC, \$4,200; '91 Isuzu Stylus, cherry red, \$2,100 OBO. Perez, 857-9677.
- '91 4x4 SUBURBAN, loaded, \$15,800; '93 Astro-EXT, loaded, \$12,950; '92 Autowagon Trailer, 22 ft., all excellent condition. Habbit, 856-1117.
- '93 RANGER, white, XLT, reg. cab, 5-spd., 4 cyl., camper shell with bed, sharp, 72K miles, \$8,770. Kerschion, 281-1671.
- '78 PONTIAC LEMANS, 2-dr, very good condition, includes 4 additional studded snow tires, \$1,500. Jerome, 299-6773.
- '75 INTERNATIONAL TRAVELALL, 107K original miles, many new parts, all repair records, strong truck, \$3,500, OBO. Kureczko, 281-8206.
- '94 FORD TAURUS GL WAGON, fully loaded, all power, 3.8 V6, dual airbags, ABS, 48K miles, \$11,200, excellent condition. Hart, 291-8774.
- '93 MAZDA B2600I LE PICKUP, 5-spd., 4x4, extra-cab, 40K miles, excellent condition, \$12,000. Nelson, 828-2755.

RECREATIONAL

- '78 HONDA CX500, with or without sidecar, full dress, customized for short person, low mileage, like new. Waldorf, 836-0642.
- MOUNTAIN BIKE, 21-spd., Diamond-back Sorrento, small frame, like new, \$90. Hietala, 867-9577.
- BIANCHI OCELOT MOUNTAIN BIKE, 21-in., 21-spd., grip shift, lights, locks, quick release wheels/seat, \$250. Holt, 294-6928.
- CAB-OVER CAMPER, shower, toilet, heater, refrigerator/freezer, recently reconditioned, spotless interior, hydraulic jacks, 2 propane tanks, \$1,750. James, 345-4006.
- '92PWC YAMAHA 650VXR, 2-person, w/cover, excellent condition, \$2,800 OBO. Hansen, 275-9917.
- '79 CHRYSLER OUTBOARD, 16-ft. trihull, with 75-hp motor, great fishing boat, \$4,000 OBO. Tony, 292-0304.
- '92 HOLIDAY RAMBLER ALUMALITE TRAILER, 32-ft., front kitchen, fully loaded, excellent condition, \$15,000. Jakubczak, 896-0716.
- '83 JAYCO TRAVEL TRAILER, J series, sleeps 6, good condition, \$1,200. Toya, 898-0491.
- '78 HARLEY DAVIDSON, 80 cu. in., frame up custom rebuild, \$10,500; 16-ft. Grumman aluminum canoe, \$250. Van Den Avyle, 898-6474.
- HOBIE 16 SAILBOAT AND TRAILER, excellent condition, garage stored, \$1,700. Lysne, 296-5037.

- FISHING BOAT/TRAILER, \$300, 3HP motor, \$200, 10HP motor, \$500, or make offer for package. Reese, 281-3498.
- ELECTRIC OUTBOARD, MinnKota, 24-lbs thrust, Energizer Marine battery, both unused, \$200, gasoline outboard, fiberglass kayak. Cooper, 881-2806.
- '79 KIT COMPANION 24 ft. motorhome, 47K miles, 440 Dodge, roof air, 2-way frig. gen., \$7,500. Schluter, 281-5954.
- BOY'S BICYCLE, 24-in boy's 10-speed bicycle; excellent working order. \$25. Owyong, 797-4137.
- '95 PACE ARROW MOTORHOME, 35 ft, loaded, 9K miles, satellite, queen master, oak/leather/Conan, awning and towbar, estate sale, \$76,000. Wemple, 281-7661.
- '86 YAMAHA MOTORCYCLE, Radian 600, excellent condition, only 6,025 mi., garage kept, just tuned, \$1,600 OBO. Oberkampff, 292-4366.

REAL ESTATE

- 3-BDR. WILLOW WOOD HOME (Eubank gate), 1 yr. old, 2 baths, 1,850 sq. ft., 2-car garage, all brick, \$173,000. Widmer, 823-9203.
- 4-BDR. PATIO HOME, 3 baths, upstairs/downstairs patios, great views, landscaped, security system, double garage, east of Tramway & Indian School, \$159,000. Kaufmann, 292-9249.
- 4-BDR. HOME, 2-1/2 baths, 3-car garage, 2,625 sq. ft., good schools, closing cost incentive, 11701 Molly Brown, \$219,900. Krause, 299-0931.
- PERFECT HORSE PROPERTY in Los Lunas, 1,800 sq.ft., new home, 3br/2ba, open floorplan, 1-acre, barn/garage, corrals. Eldred 865-1406.
- 3-BDR HOME, adobe, 1.75 baths, 1,200 sq. ft., fireplace, good neighborhood, new paint, 1.5-car garage, \$110,000. Poulter, 291-0607.
- 2-BDR TOWNHOUSE, 2 baths, 1,050 sq. ft., fireplace insert, fruit trees, 4 miles to Eubank Gate, \$94,900. Benton, 275-2602.
- 4-BDR HOME, 2-1/2 baths, 3-car garage, 2625 sq.ft., good schools, large lot, RV parking, 1% to buyer, \$214,900. Krause, 299-0931.
- 4-BDR HOME, 2,450sf, 3BA, 3-car garage, adobe fence, flagstone patio w/latillas, built 1994, 2.5 acres, Edgewood, \$198K. Distelhorst, 281-2122.
- 3-BDR HOME, Town Park, 2 bath, 2-car garage, 1,350 sq.ft. Close to Sandia, \$125,000, Conway, 294-8256.
- 4-BDR, 2-BA, 3,038sf, 2 fireplaces, library, sunroom, separate workshop/studio, orchard, North Valley, 900 Solar NW, \$225,000. Orman, 344-5446.

WANTED

- RENTAL ROOM, for visiting professor, for the summer, will be in & out frequently. Cesarano, 272-7124.
- HOUSESITTING, visiting scientist will housesit, looking for home in NE Heights, Eisenhower school district, close to shopping & Eubank, arriving August, leaving July 1998. Doyle, 844-7568.
- APARTMENT/HOUSE, rent or share, Rio Rancho area, NMSU co-op student, June to Dec. Borgman, 299-6010, c.r.borgman@worldnet.att.net.
- SMALL MICROWAVE, for 97-year-old for her "safe" afternoon tea break. Eakin, 266-0532.

WORK WANTED

- HOUSE SITTING by reliable college senior, by week or weekend, plant and pet care included. Perrine, 293-1429.

LOST & FOUND

- FOUND: Gold hoop earring, between Bldgs. 892 and 855. Call or come look at it in Bldg. 855/101E. Boyd, 844-1680.

Sandia News Briefs

Sandians win Lockheed Martin individual, team NOVA awards

Steve Montague of Integrated Micromechanics, Microsensors, & CMOS Technology Dept. 1325 has been selected to receive Lockheed Martin's NOVA award for Technical Excellence, while the California site-based Atmospheric Radiation Measurement-Unmanned Aerospace Vehicle (ARM-UAV) Team has been selected to receive the NOVA award for Teamwork. Steve was recognized for his work as the technical project leader of Sandia's intelligent micromachine technology. The ARM-UAV team's uncrewed aircraft, the Altus, conducted what is believed to be the longest scientific flight of its kind, 26 hours and 11 minutes. The NOVA awards program honors 50 individuals and teams from across the Lockheed Martin Corporation who have made outstanding contributions to Lockheed Martin mission success. Steve and a representative from the ARM-UAV team will travel to Washington for an awards ceremony at the National Air and Space Museum on June 27. Both Steve and the ARM-UAV team were honored recently at Sandia's annual Employee Recognition Awards program (*Lab News*, May 9).

Sign up now for short course in micromachine design

The fourth Sandia MEMS (microelectromechanical systems) Short Course was held April 24-25, with participants attending from a wide variety of companies as well as academia and government laboratories. Sandians and others interested in taking the next course June 24-25 should sign up early at www.mdl.sandia.gov/Micromachine to reserve a place. Since this course was first offered eight months ago, Sandia has trained more than 100 engineers to design devices in SUMMIT (Sandia Ultra-planar Multi-level Micromachine Technology).

Former VP Bert Westwood elected to Royal Academy

Bert Westwood, who retired several months ago as VP for Research and Exploratory Technology at Sandia, has been elected a Foreign Member of the Royal Academy of Engineering (U.K.) and has received the Acta Metallurgica J. Herbert Holloman Award for Contributions to Materials Technology and Society. Bert has served as president of the Industrial Research Institute of the Minerals, Metals, and Materials Society and currently is chairman of the Commission on Engineering and Technical Systems of the National Research Council. He is chairman of the board of trustees of the New Mexico Symphony Orchestra.

Send potential Sandia News Briefs to Lab News, Dept. 12640, MS 0165, fax 844-0645.

Sandia Web Watch

External Web sites can help Sandia visitors and conference attendees



Sandians planning to host conferences and official visitors — particularly first-time visitors — can make things lots easier for visitors and for themselves by referring the visitors to some Sandia External Web sites before they visit. Separate

visitors' guides exist for Sandia/New Mexico and for Sandia/California.

Both sites can be accessed from the External Web home page (<http://www.sandia.gov>) by clicking on the "About Sandia" button.

This page includes the visitors' guides under the Visiting Us category, plus several other categories of information that can help visitors and other interested people learn about the Labs, including Who We Are, What We Do, Recent Accomplishments and Awards, and more.

Viewers who prefer to go directly to the Sandia/New Mexico and Sandia/California visitor pages can do so by typing in the addresses (URLs): <http://www.sandia.gov/NM.htm> or <http://www.sandia.gov/CA.htm>, respectively.

The recently revised Sandia/New Mexico Visitors' Guide includes a variety of useful information, including directions to Sandia from the airport (including a map), a general Sandia site map, where and how to enter Kirtland Air Force Base, getting to your Sandia destination, useful telephone numbers, badging and escort requirements, prohibited items, and more. The guide

also lists contacts for arranging group tours and for visiting the National Atomic Museum.

The Sandia/California Visitors' Guide has much of the same type of information, plus a Sandia/California fact sheet, Livermore area hotel guide, and information about several major Labs facilities, including the Microelectronics Office in San Jose.

("Sandia Web Watch" is a *Lab News* series featuring news and developments about Sandia's Web sites.)

— Larry Perrine

Sandia volunteers make a difference

Sandia's Volunteers in Action Program thanks its volunteers for submitting their volunteer hours for 1996.

One hundred fifty employees, retirees, and family members contributed more than 30,000 hours to our communities.

It's not too late to report your volunteer hours. To receive a beautiful Sandia Volunteer thunderbird pin, please list the agencies and estimated hours contributed to each in 1996.

Send your list to Sandia Volunteers in Action at MS 1313 or send an e-mail message to Redd Eakin (12650) at rmeakin@sandia.gov.

Get a half life!



NATIONAL
ATOMIC
MUSEUM
Albuquerque, NM

Explore volunteer opportunities at the National Atomic Museum

Volunteers needed to form a theater group, personify historical figures, & examine historical events & issues

For more information, contact Virginia Salazar at 284-3229 or by e-mail at vsalaz@sandia.gov

Coronado Club

May 22 — Sandia retiree annual picnic. Club closed: no lunch line, no bingo, no bar.

May 23 — Kids' bingo. Free hot dog and soft drink with \$2.50 bingo card. Bingo starts at 7 p.m.; buffet line open 5-8 p.m.

May 26 — Memorial Day celebration, 11 a.m.-6 p.m. Buffet open noon-5 p.m.; music by Bob Weiler, 2-6 p.m.

June 5, 12, 19, 26 — Thursday bingo night. Card sales and a la carte buffet start at 5 p.m., early birds' bingo at 6:45 p.m. Pool open til 9 p.m.

June 8 — Sunday brunch buffet, 10 a.m.-1 p.m. \$7.95 all-you-can-eat buffet. Kids 3-12, \$1, under 3 free. Music by Bob Weiler, 1-4 p.m.

June 13 — "Western Night" dinner/dance. Music by the Starlighters, 7-11 p.m.

June 15 — Father's Day barbecue. A la carte dining on the patio, noon-6 p.m. Music by Bob Weiler, 11 a.m.-6 p.m.

Recent Patents

Robert Anderson (1841) and Carleton Seager (1111): Micromachined Silicon Electrostatic Chuck.

Gregory Frye (1315), Daniel Doughty (1521), and C. Jeffrey Brinker (1831): Coatings with Controlled Porosity and Chemical Properties.

Bruce Tuttle and William Warren (both 1812): Static Ferroelectric Memory Transistor Having Improved Data Retention.

James Novak (1315): Impedance Sensing of Flaws in Non-Homogenous Materials.

Michael Kent (1832) and Randall Saunders (1815): Block Copolymer Adhesion Promoters via Ring-Opening Metathesis Polymerization.

Bryan Burns (2345) and Thomas Cordaro (2344): Imaging Synthetic Aperture Radar.

Kevin Fleming (1554): Plasma Emission Spectroscopy Method of Tumor Therapy.

1997 US Savings Bond Drive

US Treasury announces new terms for Series EE Bonds

On April 30, the Secretary of the Treasury announced three important changes in the US Savings Bond Program that affect Series EE bonds issued on or after May 1, 1997. The new terms for Series EE bonds feature higher rates, monthly increases in value, and an early redemption penalty. The new terms will not apply to bonds with issue dates before May 1, 1997. Series HH bonds remain unchanged.

- ✓ Series EE bonds issued on or after May 1, 1997, will earn interest from the date of issue at rates equivalent to 90 percent of five-year Treasury security yields. The new rates will continue to be announced on May and Nov. 1 of each year. Current interest rate is 5.68 percent.
- ✓ Series EE bonds will now increase in value monthly, rather than every six months.
- ✓ A three-month loss of interest will apply to bonds redeemed less than five years from date of issue. This feature is designed to encourage bond owners to hold their bonds for the longer term. It will not affect bonds held for five or more years.

Lockheed Martin announces Savings Bond drawing

Sandia employees are eligible for the Lockheed Martin Corporation US Savings Bond drawing on July 21. Prizes include two \$2,500, two \$1,000, and two \$500 Savings Bonds. The drawing is for employees who are new bond buyers and those who increase their bond deductions. If you are in this category, and want to be included in the drawing, notify Juanita Sanchez at 844-1307 or jmsanch@sandia.gov by no later than July 11.

Sandia's Savings Bond Drive

May 12-23

http://www-irm.sandia.gov/organization/div10000/ctr10500/dpt10502/bonds/sb_home.html

Take
Stock
in America

U.S. SAVINGS
BONDS

<http://www.publicdebt.treas.gov/sav/sav.htm>

Retiree deaths

Jose Sanchez (90).....	4623.....	March 30
V. O. Prichard (81).....	7264.....	April 8
Erma Hatfield (90).....	3256.....	April 9
Rolland Glenn (85).....	2121.....	April 9
Arthur Pearson (82).....	8257.....	April 9
Robert Lemm (87).....	4620.....	April 12
Frances Fawver (81).....	5000.....	April 13
Preciliano Trujillo (81).....	9718.....	April 16
Billie Pierce (66).....	7556.....	April 17
John J. Miller (83).....	1251.....	April 22

Organization numbers indicate retirees' positions at the time of retirement and may not correspond to present-day organizations.